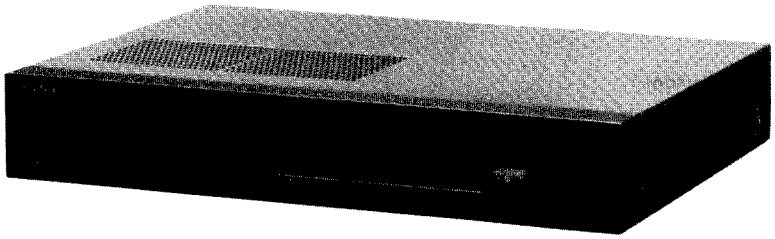
PCM-501ES

SERVICE MANUAL

AEP Model
UK Model
E Model



SPECIFICATIONS

Signal system	Conforms to CCIR television standard, PAL/SECAM (AEP, UK, E model) and NTSC (E model) color
Code format	Conforms to the technical specifications of the EIAJ (standard format using 14-bit or 16-bit quantization)
Number of audio channels	2 channels
Sampling frequency	44.1 kHz
Quantization	14-bit linear quantizing, or 16-bit linear quantizing
Frequency response	5 - 20,000 Hz ±0.5 dB
Harmonic distortion	Less than 0.007% (14-bit format) Less than 0.005% (16-bit format)
Dynamic range	More than 86 dB (14-bit format) More than 90 dB (16-bit format)
Channel separation	More than 80 dB
Wow and flutter	Below measurable limit
Error correction	Error correction and concealment using CRCC and parity
Emphasis	Pre-emphasis (on recording) : fixed at ON De-emphasis (on playback) : automatically switched ON or OFF (by detecting pre-emphasis identification code) Time-constant : 50 μsec, 15 μsec

Inputs

	Type	Reference input level	Impedance	Minimum input level
LINE IN	Phono	0.24 V (−10 dBs)	50 kilohms	77.5 mV (−20 dBs)
VIDEO IN	Phono	1 Vp-p	75 ohms	—

Outputs

	Type	Reference output level	Load impedance
LINE OUT	Phono	0.24 B (−10 dBs)	More than 10 kilohms
MONITOR OUT	Phono	1 Vp-p	75 ohms
VIDEO OUT	Phono	1 Vp-p	75 ohms
COPY OUT	Phono	1 Vp-p	75 ohms
HEADPHONES	Stereo phone	0.9—0.003 mW Continuously Adjustable	32 ohms

— Continued on page 2 —

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

MICROFILM

DIGITAL AUDIO PROCESSOR

SONY®

AUD

PCM-501ES

General

Power requirements	AEP model: 220 V ac (or 240 V ac adjustable by authorized Sony personnel), 50/60 Hz UK model: 240 V ac (or 220 V ac adjustable by authorized Sony personnel) 50/60 Hz E model: 110, 120, 220 or 240 V ac adjustable. 50/60 Hz
Power consumption	AEP, UK model: 33 W E model: 35 W
Dimensions	Approx. 430 x 80 x 350 mm (w/h/d) (17 x 3 1/4 x 14 7/8 inches) including projecting parts and controls
Weight	6.0 kg (net) (13 lb 1 oz.) 7.0 kg (in shipping carton) (15 lb 3 oz.)

FEATURES

In conventional analog recording systems, the quality of sound reproduction depends upon the properties of magnetic tape and heads. Even with the latest metal tape it is virtually impossible to bypass the inherent limitations of conventional analog recording, including its limited dynamic range and frequency response, and its associated distortion.

The Pulse Code Modulation (PCM) system ushers in a new era of sound reproduction and offers performance and fidelity far superior to analog systems. In the PCM system, sound levels are converted to a series of binary codes. This information is recorded as digital pulses of equal amplitude. In playback, all that has to be done is to discriminate between the presence and absence of a pulse. The quality of recording and playback is thus not dependent on the characteristics of tape and heads.

The PCM-501ES is the latest and most sophisticated Sony PCM digital audio processor for general audio use. It offers its own built-in power source for convenient operation, and the host of other features outlined below for the ultimate in audio listening pleasure. The PCM-501ES gives you stereo sound reproduction with a wide dynamic range, minimal distortion, low wow and flutter (even lower than the measurable limit), and a flat frequency response. Listening to digital audio sound tapes on your PCM-501ES is just like being in a concert hall.

Compact PCM digital audio processor with modern component design
While several hundred ICs are employed in the digital processing circuitry of conventional digital audio processors, 5 new LSIs help make the PCM-501ES as compact and modern in design as your other audio equipment. The unit also incorporates A/D (analog-to-digital) and D/A (digital-to-analog) converters which are newly developed monolithics. All function to make the PCM-501ES unexcelled in performance and reliability.

Resolution selector for recording and playback with wider dynamic range and less distortion
The PCM-501ES was developed in accordance with the technical specifications of the Electronic Industries Association of Japan (EIAJ), which has adopted the 14-bit and 16-bit linear quantization format. The 16-bit linear quantization format offers a wider dynamic range and less distortion than the 14-bit format. The 14-bit and 16-bit formats can be selected with the REC RESOLUTION (record resolution) selector.

OVC (optimum video condition) control
With the OVC indicator illumination, the VTR error condition caused by a stained head or unstable tape transport can be detected. In line with the output signal of the VTR, the optimum combination of VTR and this unit can be obtained in playback mode.

Easy tracking adjustment for tracking of video heads
The R (right) channel of the peak program meters converts to a tracking meter, allowing for easy and correct tracking adjustment of the video heads.

AUTO PB MUTE (auto playback muting) button provides option of continuous listening
The PCM-501ES features a playback muting system that gives you the option of having dropouts cut out automatically when the muting circuit is switched on. Or, you can simply keep the button released for continuous, uninterrupted listening. Muting also functions at double and triple tape speed.

Extremely accurate error-detection and correction circuits
These keep dropout errors from effecting the quality of sound reproduction.

Convenient record muting function
A highly convenient record muting function allows you to create blank spacing between selections to cut out unwanted talk and commercials.

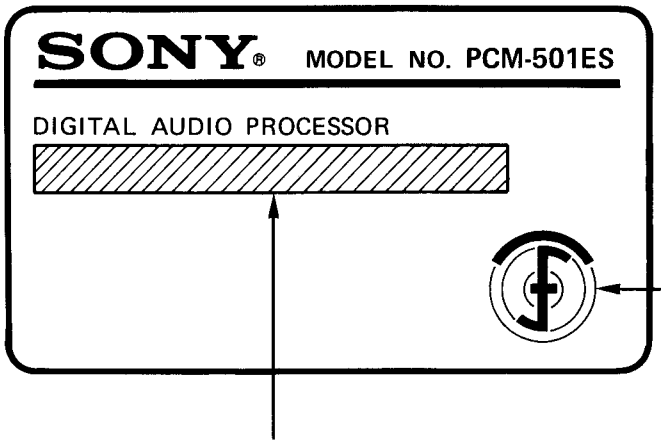
COPY OUT jack for perfect tape copies
Multi-generation, digital-to-digital tape copy can be performed using the COPY OUT jack on the back of the unit with absolutely no deterioration in signal quality.

Bright, easy-to-read peak program meters
Fluorescent peak program meters provide two types of sound level indication for precision setting of recording and playback levels.

Separate MONITOR OUTPUT jack allows connection with the component TV, such as Sony Profeel series, and other video monitors
There's no need to disconnect your digtal audio processor to monitor video tapes and TV. The MONITOR OUTPUT jack on the back of the PCM-501ES allows transmission of video signals whether the PCM unit is switched on or off.

MODEL IDENTIFICATION

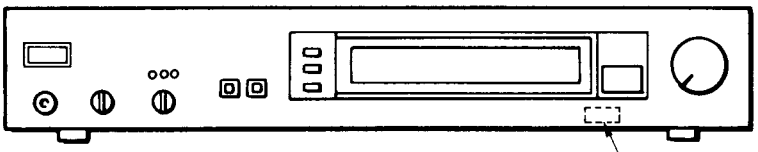
– Specification label on jack plate –



AEP, G-AEP model:	AC: 220 V ~ 50/60 Hz 33 W
UK model:	AC: 240 V ~ 50/60 Hz 33 W
E model:	AC: 110, 120, 220, 240 V ~ 50/60 Hz 35 W

SIGNAL SYSTEM IDENTIFICATION

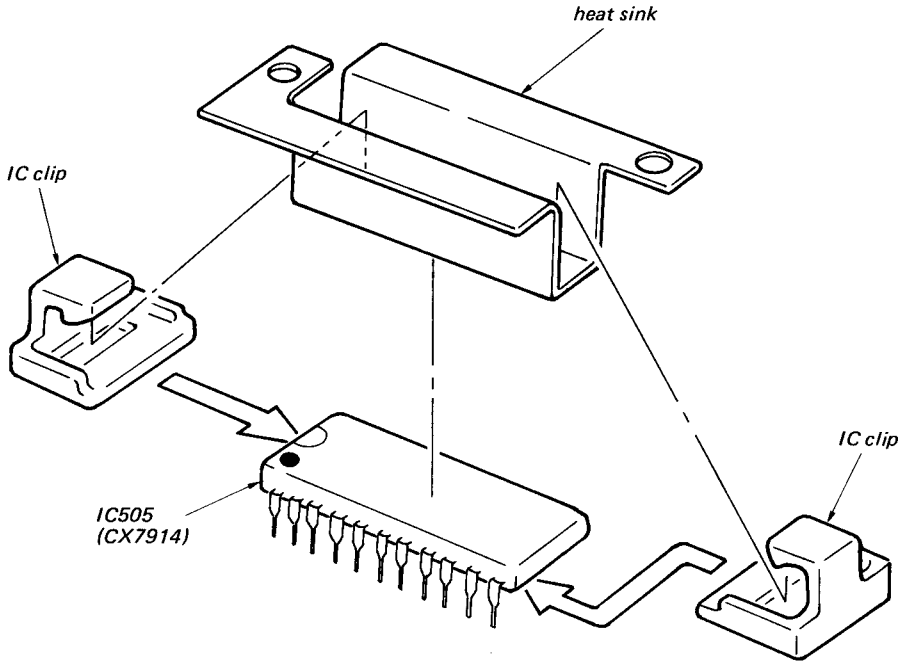
Front panel



NTSC System:	(no lettering)
PAL/SECAM System:	PAL/SECAM

Notes on IC505 Replacement

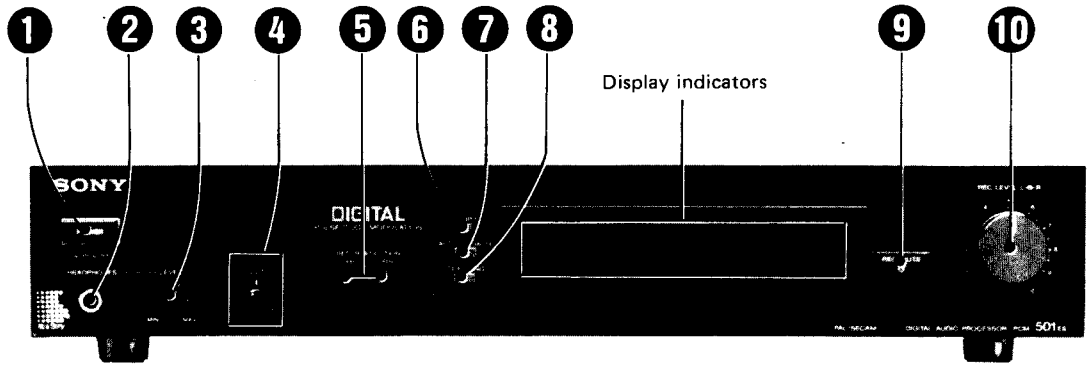
- When replacing IC505, first clean the top of the IC and the bottom of the heat sink with alcohol, then apply an epoxy type adhesive* to the heat sink with IC chip, as shown in the illustration below.



* Epoxy type adhesive: Sony bond SC1000 or other quick drying 2 liquid compound.

LOCATION AND FUNCTION OF CONTROLS

FRONT PANEL



1 POWER switch
Press to turn on the power. The peak program meter indicators will illuminate. To turn the power off, press the switch again.

2 HEADPHONES jack (stereo phone jack)
Insert the headphones to monitor recording input levels, or to listen to a recording in the playback mode.

3 LEVEL (headphone level) control
Used to adjust the headphone level.

4 OVC (optimum video condition) control and indicators
To adjust the combination of the VTR and this unit, depress the TRACKING button and adjust this control together with the picture control knob of the VTR while watching the OVC indicator illuminations (see "Using the OVC control", page 11).

5 REC RESOLUTION (record resolution) selectors
These buttons select the resolution for recording.
For normal operation, keep the 16-BIT button pressed.

14-BIT: for recording in accordance with the technical specifications of the Electronic Industries Association of Japan (EIAJ) which has adopted the 14-bit linear quantization format.
Press this button when the tape recorded with this unit is to be played back using another PCM digital audio processor which conforms to the 14-bit quantization format of the EIAJ.

16-BIT: for recording and playing back in the 16-bit quantization format of the EIAJ. As the 16-bit format offers a wider dynamic range and less distortion than the 14-bit format, normally use the 16-BIT selector setting.

During playback, the proper quantization format is automatically selected for the tape being played.

6 COPY (digital tape copy) button
Depress this button for digital-to-digital tape copying using a pair of VTRs and the COPY OUT jack at the rear. The COPY indicator illuminates when the copy switching is activated.
● Be sure to release the COPY button except for digital tape copy. With the button depressed, signals are not transmitted through the VIDEO OUT jack (see "Making Digital Tape Copies", page 12).

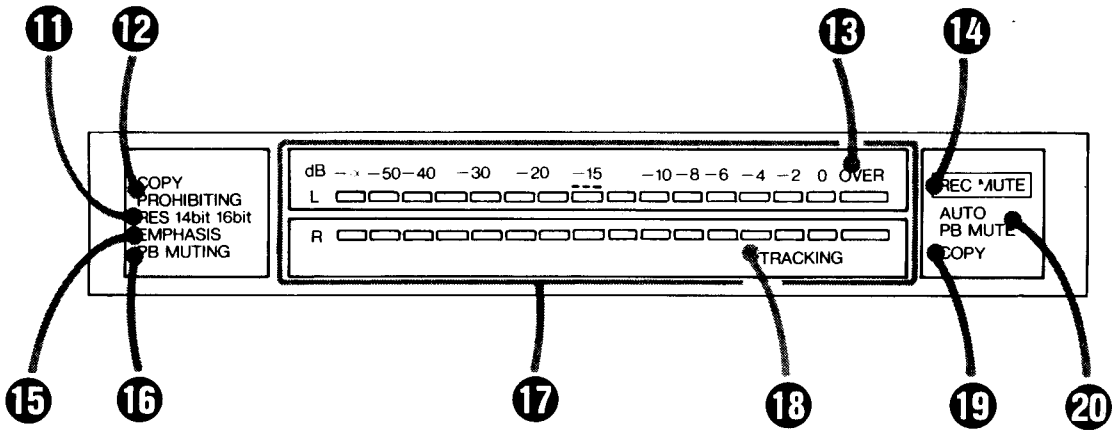
7 AUTO PB MUTE (auto playback muting) button
The playback muting circuit activates automatically when you depress this button and the AUTO PB MUTE, indicator lights when the muting circuit is functioning. You only need to press and release the button when you want the muting function turned off.
The playback muting circuit cuts out sound reproduction when frequent dropouts occur due to mistracking of the heads of the VTR, or scratches and dust on the magnetic tape. If you do not want the sound reproduction cut off, such as with low quality tapes, release the AUTO PB MUTE button ao that the AUTO PB MUTE indicator goes off (see "Using the AUTO PB MUTE button", page 11).

8 TRACKING button
Depress this button to convert the peak program meters into a tracking meter. Each time the button is switched, the function of the meter changes.

9 ○ REC MUTE (record muting) button and indicator
Keep this button depressed to eliminate unwanted material and to create blank spacing between selections when recording. The REC MUTE indicator illuminates while the button is kept pressed, and the level of the recorded signal is reduced to "Zero". While the record muting is operating the video control signal of the VTR is still transmitted to permit proper playback.

10 REC LEVEL (record level) control
These controls adjust the recording level. The outer control is for the left channel, and the inner control is for the right channel.

DISPLAY INDICATORS



⑪ RES (resolution) indicator
Displays the resolution (14-bit or 16-bit) of the signal being transmitted to the VIDEO IN jack. During playback, this indicator automatically displays the resolution of the tape being played, regardless of the REC RESOLUTION selector setting.

⑫ COPY PROHIBITNG indicator
When a tape with a tape copy prohibiting code is played back, this indicator will light up to show that a digital tape copy cannot be made.

⑬ OVER indicators
Light up when recording level signals exceed "0" dB to warn that the recording level is too high.

Note : This indicator lights primarily as indication that the LINE IN signal exceeds "0" dB and it will also light during playback when the LINE IN signal exceeds "0" dB. Disregard the "OVER" indication during playback while other equipment is operating.

⑭ REC MUTE (record muting) indicator
Illuminates while the O REC MUTE button is depressed.

⑮ EMPHASIS indicator
This model PCM digital processor features an emphasis circuit that automatically activates to improve the signal-to-noise ratio of digital tapes. All tapes which are recorded and later played back on this unit are "emphasized", as are prerecorded tapes featuring emphasis, and tapes recorded on other PCM digital processors using emphasis.
When tapes recorded without emphasis on other digital processors are played on this unit, the EMPHASIS indicator will not illuminate.

⑯ PB MUTING (playback muting) indicator
When the VTR is not transporting the tape at the proper speed, such as at the beginning of tape playback, or when frequent dropouts occur, the PB MUTING indicator lights. Note that as this indicator merely indicates that the muting circuit is investigating dropouts, it lights also when the AUTO PB MUTE button is released (although muting isn't effected in this instance).

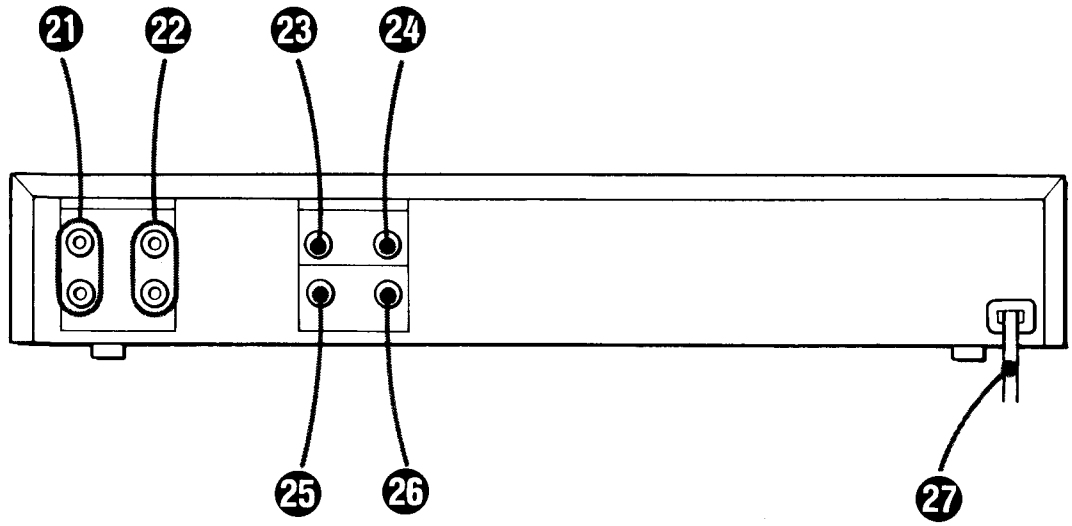
⑰ Peak program meter indicators
These fluorescent indicators illuminate to indicate the input level of each channel during recording, and the recorded level during playback. For easy reading, they hold the level of the highest peak while also following the level of transient peaks below the peak.
When the TRACKING button is depressed, the lower (R) channel meter converts to a tracking meter that gives the tracking condition of the VTR.

⑱ TRACKING indicator
This indicator illuminates when you depress the TRACKING button to readjust the tracking of the VTR and indicates that the tracking meter is being displayed in place of the peak program meters. The meter indication moves further to the right as tracking improves.

⑲ COPY indicator
Illuminates when the COPY button is depressed.

⑳ AUTO PB MUTE indicator
When the AUTO PB MUTE button is depressed, this indicator illuminates to indicate that the auto muting circuit is activated.

REAR PANEL



㉑ LINE IN (phono input jacks for audio components)
Connect these jacks with the tape outputs of an audio amplifier and the LINE OUT jacks of a stereo microphone amplifier.

㉒ LINE OUT (phono output jacks for audio components)
Connect these jacks with the tape inputs of an audio amplifier.

㉓ VIDEO IN (phono jack)
Connect this jack to the video outputs of a VTR.

㉔ VIDEO OUT (phono jack)
Connect this jack to the video inputs of a VTR. (Note: the output signal for this jack is cut off when the COPY button is depressed.)

㉕ MONITOR OUT (phono jack)
Connect this jack to the input jack of component TV, such as Sony Profeel series, and other video monitors.
With this jack, the video signal can be monitored on the connected component TV, such as Sony Profeel series, without changing the connection regardless of the POWER switch setting of this unit.

㉖ COPY OUT (phono jack)
For digital tape copying. When making digital tape copies, connect the COPY OUT jack to the VIDEO IN jack of the second VTR and depress the COPY button. VTR 1 will be used to play back the recorded tape and VTR 2 will make the copy.

Note: The COPY OUT jack can also be used for conventional recording of two tapes simultaneously. In this instance, keep the COPY button released.

CAUTION: Only use the COPY OUT jack for digital copying or for simultaneous recording using two VTRs. Never make connections with the COPY OUT jack for normal recording using only one VTR. If the COPY OUT jack is used as a conventional video output, distorted sound reproduction will result.

㉗ Power cord

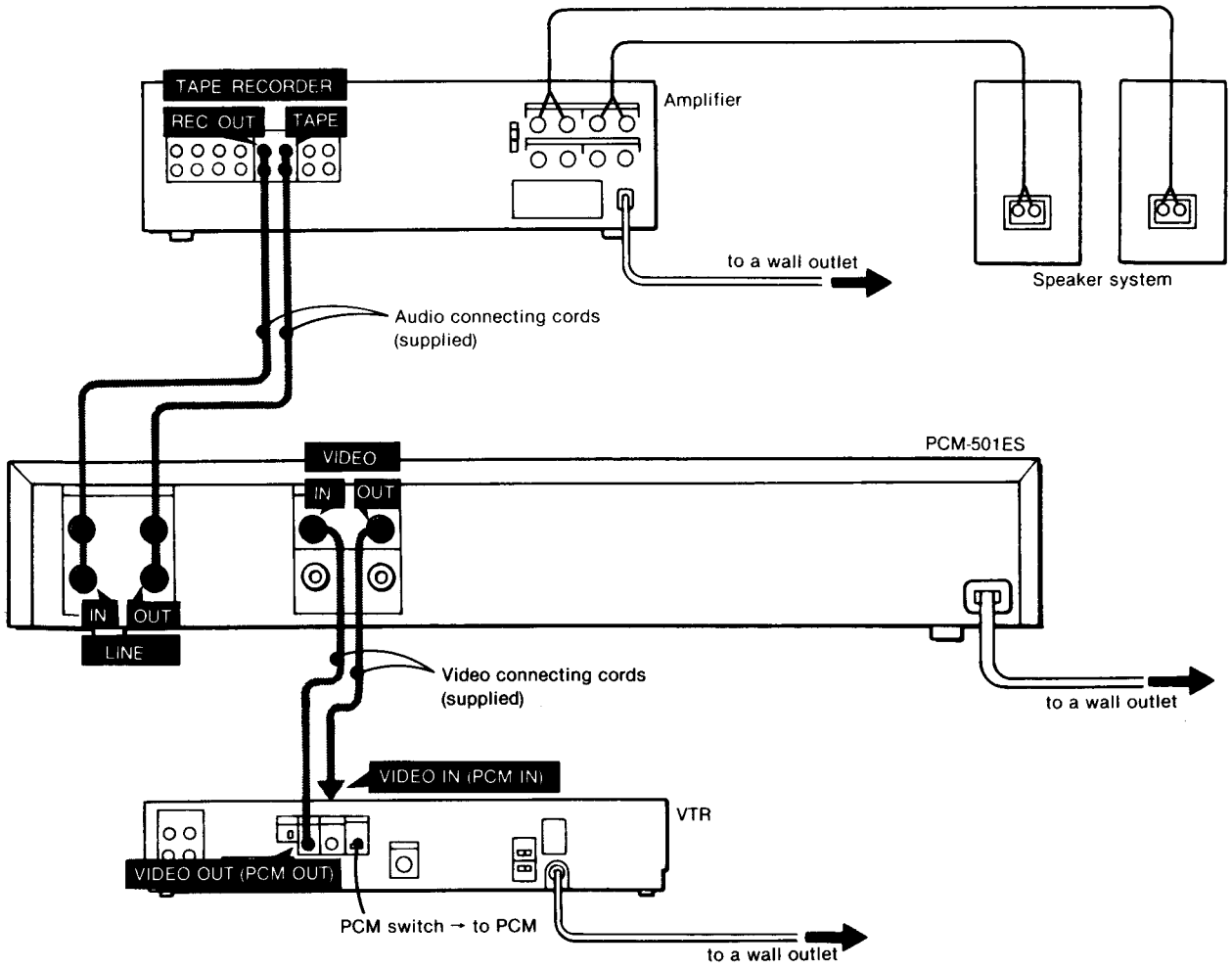
BASIC SYSTEM CONNECTIONS

(with VTR, amplifier and speaker system)

For basic hook up of your PCM-501ES for digital audio recording, connect the unit with a VTR, amplifier and speaker system as diagrammed below. For detailed instructions on connecting the respective components, refer to the instruction manual furnished with each unit.

Proceed in accordance with text as diagrammed :

- Turn off the amplifier before making connections.
- The supplied connecting cords with the red and white plugs are for hook up with audio equipment. (Connect these to the LINE IN/OUT jacks of the PCM unit and the audio component). The cords with yellow plugs are for hook up with the VTR (Connect these between the VIDEO IN/OUT jacks of the PCM and the VTR).
- Be sure to connect the red plug of the audio connecting cord to the right-channel (R) jack and the white plug to the left-channel (L) jack.
- Insert connecting plugs firmly as loose connections may cause hum and noise. Also keep connecting cords away from power cords and speaker cords to avoid hum pick-up, and keep cords away from antenna leads as this could cause both audio and video reception interference.
- For quality digital audio recording, we recommend that you use Sony Betamax models.



CAUTION

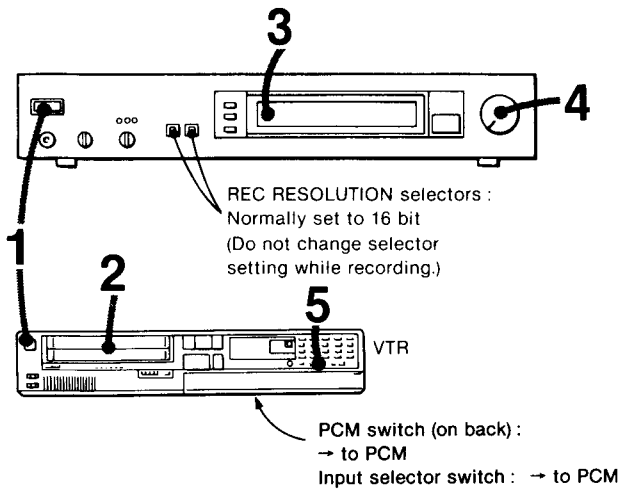
Your speaker system could be damaged if PCM digital tapes are copied at high output with VTR if connections are made to the auxiliary (AUX) or tuner input jacks. Avoid copying in this manner if at all possible ; if your set up requires that you make connections in this manner, be sure to record at a low level.

Power cord polarity

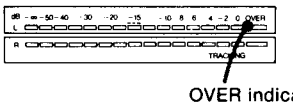
A white mark is visible on the lead of the power cord.
This will help to operate the PCM-501ES and the other components of the system "in phase" by aligning the ac power cord polarities with the ac outlet polarities. In most cases, the marked plug of the PCM-501ES power cord should be inserted into the grounded side of the ac outlet.

PCM DIGITAL RECORDING

The basic procedure for PCM digital recording is described below. Follow the numbered sequence. Be sure to refer to the instruction manual supplied with the respective components to ensure quality recording.



1 Turn on the power switches.
2 Insert a video cassette.
3 Check that the PB MUTING indicator des not light.
This could indicate that the tape is damaged. If the PB MUTING indicator lights, replace the tape to ensure quality recording.
4 Adjust the sound level for the tape to be recorded.
Adjust the REC LEVEL controls so that the red OVER indicators on the peak program meters do not illuminate at the highest signal level (see "Recording Level Adjustment").



5 To record, hold the RECORD button depressed and press the PLAY button.

When the recording is completed, press the STOP button.

With video cassettes for PCM digital audio recording :
Use of mode or mode is recommended for PCM recording and playback.

PCM switch :
(Is PCM recording possible with a VTR with no PCM switch?)
When the PCM switch of the VTR is set to ON, the picture compensation circuit, which functions if dropout occurs in playback mode, does not operate.
In this occurs in the normal VTR operation, the video image quality is impaired. However, with PCM, the unit detects only 1 or 0 and compensation is not required.
With this compensation, the data which can still be read with the PCM unit is compensated beforehand, resulting in unnecessary error. When your VTR is equipped with a PCM switch, set it to ON only for PCM playback.
Even with a VTR without a PCM switch, the PCM-501ES can read and compensation error data with its error processing circuit, so there is no probelm.

RECORDING LEVEL ADJUSTMENT

The PCM recording system has no reference level, but an absolute maximum value of 0 dB. If all the input signals are recorded under 0 dB, the PCM-501ES assures equal characteristics at any input level. This is why the peak program meters of this unit have no plus indications.
Note that the peak program meters show the pre-emphasized input signal levels. For this reason, it is important to adjust the recording level so that there will be no clipping over 0 dB.

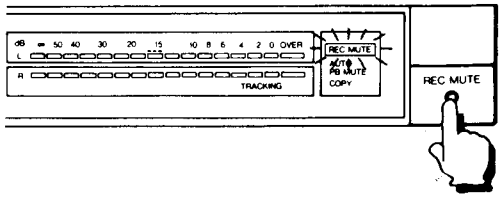
Adjust the recording level with the REC LEVEL controls so that the peak program meters do not deflect over 0 dB.
The red illumination of the OVER indicators warns of an overload during recording. If the indicators illuminate frequently, the recording level is set too high (this will result in overload and distorted recording). As the peak program meters used in this unit are far more sensitive than conventional VU meters, also be careful not to set the recording level too low, as the signal-to-noise ratio will deteriorate. The correct recording level settings vary with the program source you are recording. Generally, adjust the level to about −15 dB.

RECORD MUTING

By using the ○ REC MUTE button during recording, you can provide an interspacing in the recording, eliminating unwanted material such as talk and commercials.

To insert a blank
Depress the ○ REC MUTE button for as many seconds as you want the blank segment on the tape to be. The REC MUTE indicator will light. When you release the button, recording will resume.

Note : Although the incoming signal is not recorded on the tape while the record muting function is operating, the signal levels continue to register on the peak program meters and you can monitor the program source through the speakers or headphones.



Normally keep the COPY button released :
The COPY button should be depressed only for digital tape copying. Always press and release the button for conventional recording and playback (conventional recordings cannot be made with the COPY button depressed).

Avoid excessive use of the "PAUSE" button of VTRs :
The PAUSE button of a VTR is highly convenient for video recording and playback. For digital audio tapes, however, extended use of the PAUSE button could damage the tape. When recording or playing digital audio tapes, use the PAUSE button only when needed, and do not leave it ON for extended periods of time. Also note that with certain VTRs the playback muting function does not operate efficiently while the PAUSE button is depressed and noise will be heard.

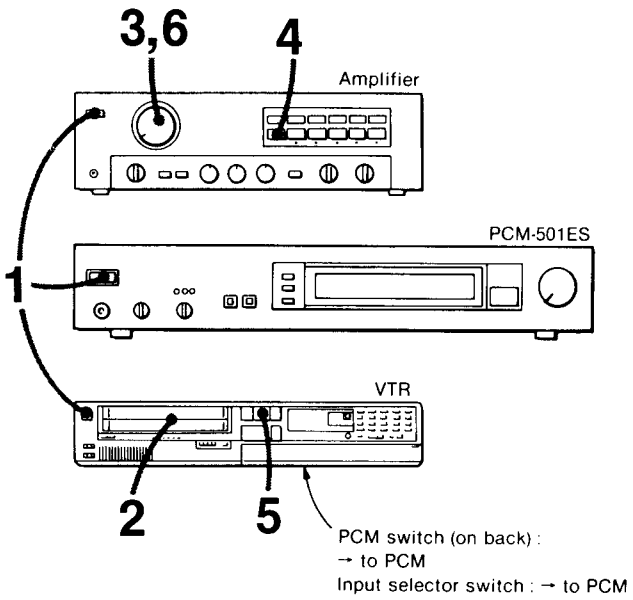
If the peak program meters do not respond when monitoring a recording :
Check that the VIDEO IN jack of the PCM unit and the VIDEO OUT jack of the VTR are firmly connected.
Although recording is possible if these connections aren't made, you cannot monitor the recording, and the peak program meters will not deflect.

If the record button of the VTR doesn't operate :
Video cassettes incorporate safety tabs just as do audio cassettes and chances are the tabs have been removed. If so, simply cover the slot with a piece of plastic tape (refer to the instruction manual of your VTR for details).

How to make connections for recording two digital tapes simultaneously :
Connect the second VTR to the COPY OUT jack of the PCM unit.

PCM DIGITAL TAPE PLAYBACK

The basic procedure for playback of digital audio tapes with your PCM digital processor and a VTR are described below ; follow the numbered sequence. Refer to the instruction manuals of the respective components to ensure quality playback.



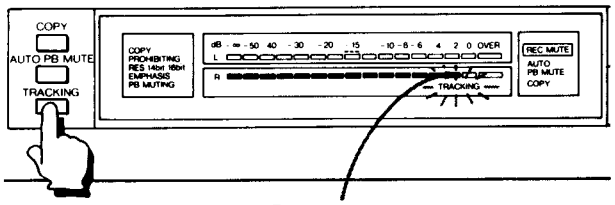
1 Turn the POWER switch of each equipment on.
2 Insert a recorded video cassette.
3 Turn down the amplifier volume.
4 Press the TAPE switch (or set the tape monitor switch to TAPE) as indicated in amplifier instruction manual.
5 Press the video recorder PLAY button to begin playback.
6 Adjust the volume to suit your preference.

Set the amplifier volume relatively low :
In the PCM system, a wider dynamic range is achieved than with the conventional analog system, and the peaks of high level inputs are recorded with high-fidelity. Also, the noise level is generally very low. If you turn up the volume inadvertently while listening to parts of the tape where no audio signals are present, or while low level imputs are being recorded, the speakers could be damaged when these portions of the tape are played. Take extra care not to inadvertently turn the volume up in the above situations.

ADJUSTING THE TRACKING OF THE VTR

When a video tape recorded on another VTR is played back, dropouts occasionally occur due to mistracking of the video heads. To obtain optimum sound reproduction, adjust the tracking of the VTR as follows.

1 Depress the TRACKING button. The TRACKING indicator will illuminate, and the lower peak level meter will convert to a tracking meter.
2 Insert the video cassette and set the VTR to the playback mode. After the PB MUTING indicator goes off, adjust the tracking control of the VTR while observing the tracking meter scale on the PCM unit. Adjust the control so that the rightmost indicators illuminate within the permissible range of the tracking meter.



Rightmost indicator within the permissible tracking adjustment range

For details on setting the correct tracking adjustment, refer to the instruction manual furnished with your VTR.

USING THE OVC CONTROL

With the OVC (Optimum Video Condition) control and indicators, the picture control of the VTR can be adjusted to the optimum point to obtain the best combination of the VTR and this unit.

1 Depress the TRACKING button (one of the OVC indicators flashes or lights) and adjust the tracking of the VTR.
2 Set the OVC control of this unit and the picture control of the VTR to the center positions and monitor the illumination of the OVC indicator. The OVC indicator shows the VTR condition during tape transport as follows.

☀ lights ☼ flashes

OVC indicator		
Red	Green	Green
○	○	○
○	○	☀
○	○	☼
○	☼	○
☼	○	○
☀	○	○

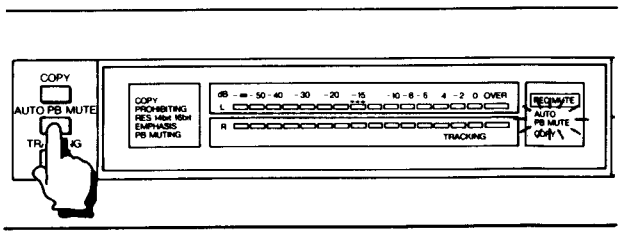
3 Turn the OVC control to the right or left so that the OVC indicator on the right lights up or flashes, or the middle indicator flashes.
4 If the optimum video condition cannot be obtained within the adjustable range of the OVC control, return the OVC control to the center position and turn the picture control of the VTR to the right or left.
5 Repeat step 3. Now the best combination of the VTR and this unit is obtained.

Once the optimum video condition is obtained, it is not necessary to readjust the OVC control even if red OVC indicator sometimes flashes or lights up. The built-in error process circuit functions at that time.
If the red OVC indicator frequently flashes, clean the head or replace the video tape.

Note: The OVC indicator shows the logically counted PCM data condition. Therefore, the VTR condition is checked only with the PCM data and it does not correspond to the video image condition. In general, PCM data error occurrence tends to decrease when no image or dropout compensation is applied.

USING THE AUTO PB MUTE BUTTON

The playback muting circuit activates automatically when you depress the AUTO PB MUTE button. It serves to cut out the faulty sound reproduction that results when frequent dropouts arise due to scratches and dust on the tape, or the sound distortion that occurs when the tape speed varies such as at the beginning of tape playback, during accelerated tape advance, or when you press the pause button.
If the muting circuit activates so often as to make listening unpleasant, adjust the tracking control of the VTR, then press and release the AUTO PB MUTE button. This will permit you to continue listening without interruption, although a certain amount of noise will be reproduced.



Note: With very poor quality or damaged tapes, sound may still be somewhat muted, even if the AUTO PB MUTE button is released. Note that the PB MUTING indicator will also light when the PB MUTING button is released, although in this instance muting is not effected.

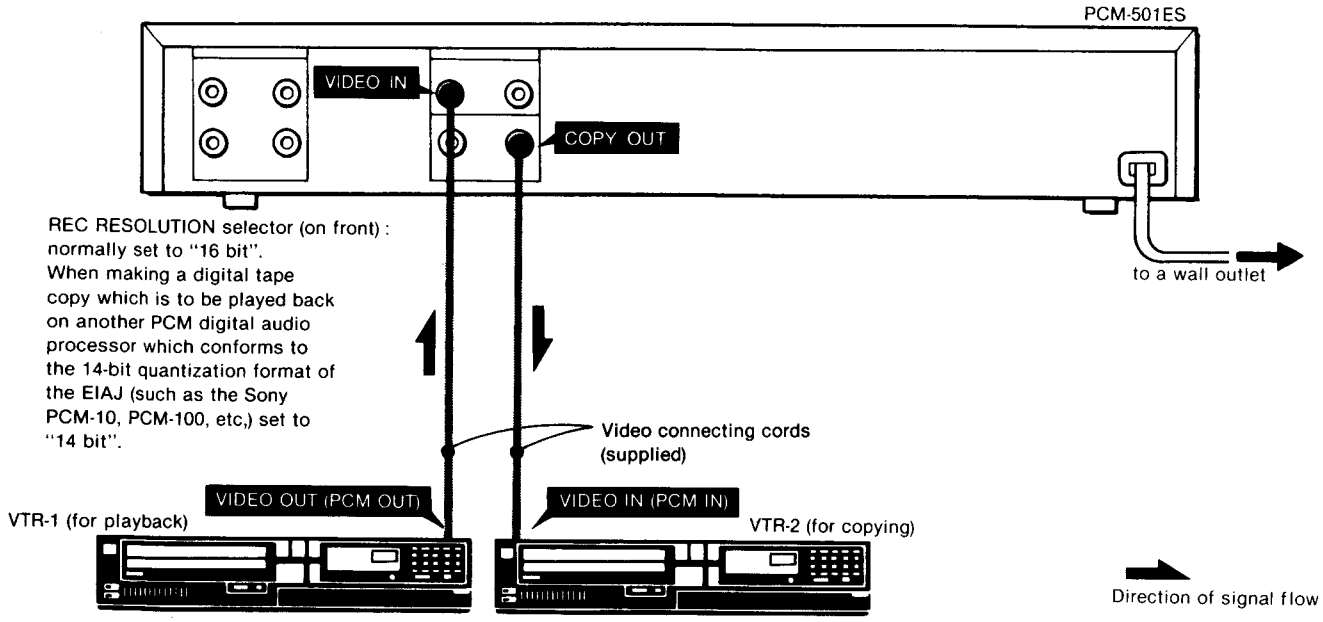
IMPORTANT

Be extremely careful that you do not mistakenly play a recorded video cassette tape in place of a digital sound tape while using the PCM unit. If you do this and the AUTO PB MUTE button is released, the video data could be misread for PCM data and clicking noise might occur which could damage your speakers. Also, be careful not to mistake a brand new, unrecorded tape for a recorded tape and play it. This could also produce noise detrimental to your speakers.

MAKING DIGITAL TAPE COPIES

Digital tape copies can be made with your PCM digital processor using a pair of VTRs and the COPY OUT jack on the back of the PCM unit.
The high-quality recording characteristics of PCM digital processing, aided by extremely efficient error detection and correction circuits, ensures absolutely no deterioration in sound quality for digital-to-digital copying.

Make the connections as diagrammed below. Be sure that the COPY OUT jack of the PCM unit is connected to the video input of the VTR being used to make the copy (VTR-2). Familiarize yourself with the operating features of both VTRs beforehand to ensure proper copying.


PCM-501ES
VIDEO IN
COPY OUT
REC RESOLUTION selector (on front) : normally set to "16 bit". When making a digital tape copy which is to be played back on another PCM digital audio processor which conforms to the 14-bit quantization format of the EIAJ (such as the Sony PCM-10, PCM-100, etc,) set to "14 bit".
to a wall outlet
Video connecting cords (supplied)
VIDEO OUT (PCM OUT)
VIDEO IN (PCM IN)
VTR-1 (for playback)
VTR-2 (for copying)
Direction of signal flow

COPYING PROCEDURE

1 Turn on the power for all units.
2 Insert the recorded tape into the VTR you are using for playback (VTR-1), and a blank tape into the VTR you are using to make the copy (VTR-2).
3 Depress the PCM-501ES COPY button (the COPY indicator will light).
4 Start playback for VTR-1, and set VTR-2 to record. Copying will begin.

- Noise interference may result if you depress the COPY button while the volume is turned up. Keep the amplifier volume turned down when you press the COPY button.
- When the COPY PROHIBITING indicator is lit on the display panel of the PCM unit, copies cannot be made, even though the COPY button is released.
- Always press and release the COPY button when tape copy has been completed.

Do not worry about the presence of distortion when monitoring digital tape copies :
When digital tape copies are monitored the COPY button is depressed, and sound reproduction through the headphones or speakers may be somewhat distorted. However, the tapes will be copied with no deterioration in signal quality and the distortion will be corrected during normal playback with the COPY button released.

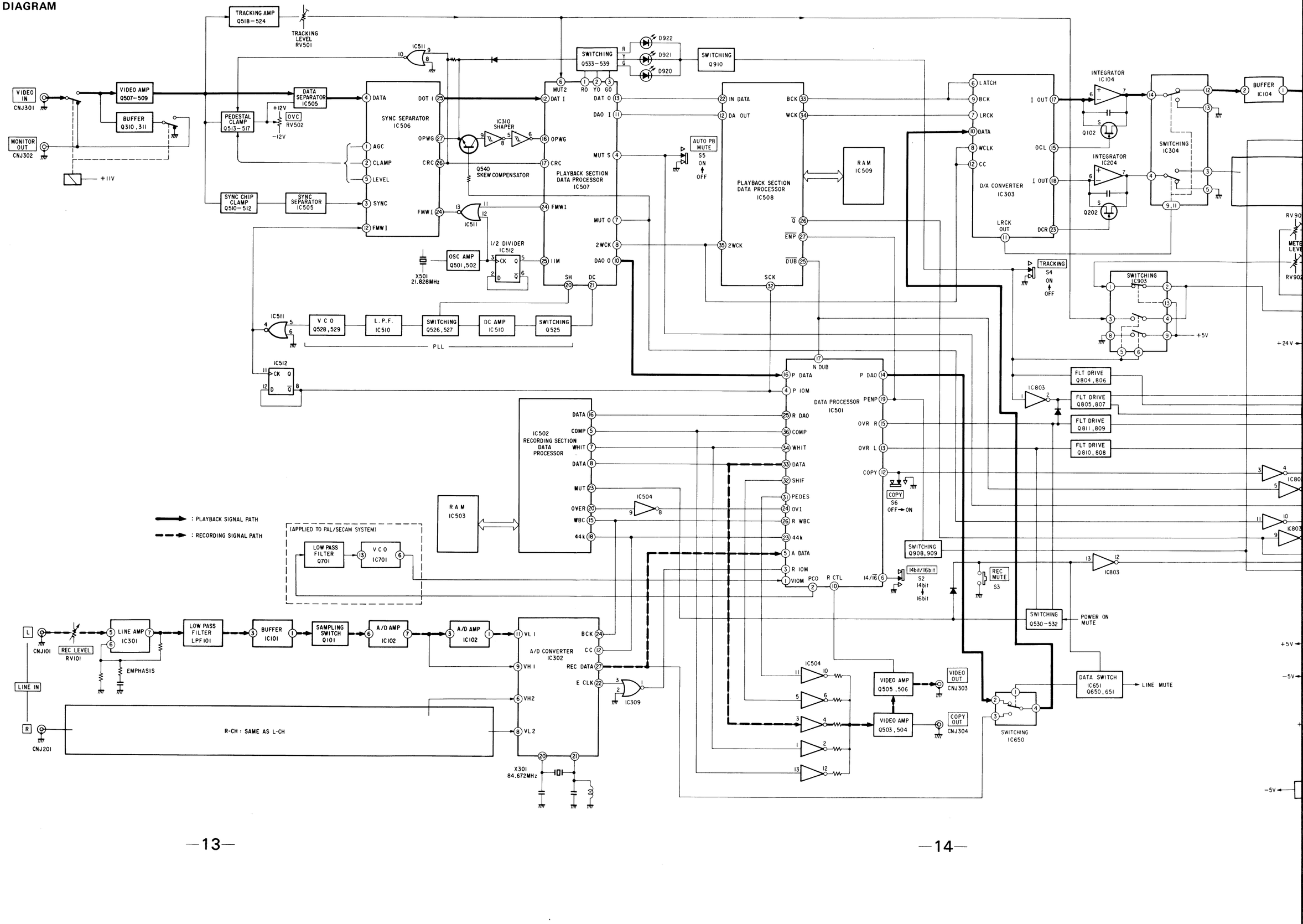
You do not need to adjust the recording level for digital tape copying :
Digital-to-digital tape copies are made at the signal level reaching the COPY OUT jack of the PCM unit during copying. Recording level adjustment isn't necessary.

Digital tapes with a "COPY PROHIBITING" code cannot be copied :
When tapes with a "copy prohibiting" code are played, the COPY PROHIBITING indicator lights on the display of the PCM unit and copies cannot be made.

Digital tape copies cannot be made with the COPY button released :
Always depress the COPY button when making digital tape copies and press and release the button after the copies have been made. Do not change the setting of the button during tape copying or during normal recording and playback. Digital-to-digital tape copies cannot be made with the COPY button released.

SECTION 1
OUTLINE

1-1. BLOCK DIAGRAM



PCM-501ES

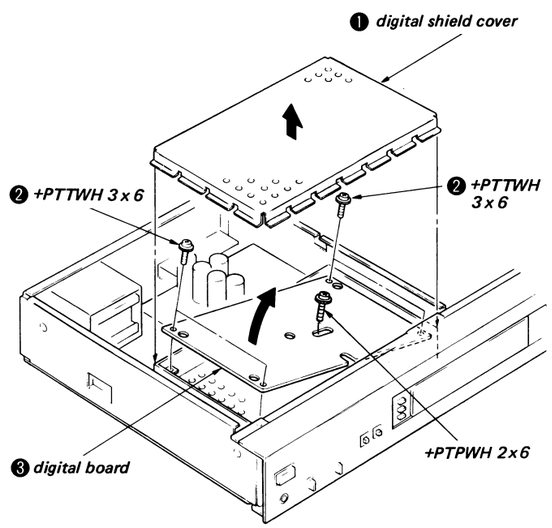
SWITCHING Q533–539
D922
D921
D920
SWITCHING Q910
MUT2
RO YO GO
DAT I
DAT O
DAO I
MUT S
IC310 SHAPER
OPWG
CRC
Q540 SKEW COMPENSATOR
PLAYBACK SECTION DATA PROCESSOR IC507
AUTO PB MUTE S5 ON OFF
FMWI
MUT O
2WCK
DAO O
1/2 DIVIDER IC512
IIM
SH
DC
DC AMP IC510
SWITCHING Q525
IN DATA
DA OUT
BCK
WCK
PLAYBACK SECTION DATA PROCESSOR IC508
RAM IC509
Q
ENP
DUB
SCK
2WCK
LATCH
BCK
LRCK
DATA
WCLK
CC
D/A CONVERTER IC303
LRCK OUT
I OUT
DCL
I OUT
DCR
INTEGRATOR IC104
Q102
INTEGRATOR IC204
Q202
SWITCHING IC304
9,11
BUFFER IC104
LOW PASS FILTER LPF102
LINE AMP, DE-EMPHASIS IC103
DE-EMPHASIS RY302
MUTING RY301
POWER ON MUTE LINE MUTE
HEADPHONE AMP IC305
HEADPHONES LEVEL RV105
LINE OUT CNJ102
HEADPHONES J301
R-CH: SAME AS L-CH
R-CH
RV901
METER LEVEL
RV902
log AMP
L-CH
R-CH
METER AMP IC308
METER AMP IC308
METER DRIVE IC801
METER
FL801 FLUORESCENT INDICATOR TUBE
G3
G1
G2
TRACKING
L, R
OVER R
OVER L
+24V
SWITCHING Q802
SWITCHING Q801
SWITCHING Q803
TRACKING S4 ON OFF
SWITCHING IC905
+5V
N DUB
P DATA
P IOM
P DAO
PENP
OVR R
OVR L
COPY
COPY S6 OFF→ON
IC803
FLT DRIVE Q804,806
FLT DRIVE Q805,807
FLT DRIVE Q811,809
FLT DRIVE Q810,808
DATA PROCESSOR IC501
IC502 RECORDING SECTION DATA PROCESSOR
DATA
COMP
WHIT
DATA
MUT
OVER
WBC
44k
R DAO
COMP
WHIT
DATA
SHIF
PEDES
OVI
R WBC
44k
A DATA
R IOM
VIOM
IC504
SWITCHING Q908,909
14/16
14bit/16bit S2 14bit 16bit
PCO
R CTL
REC MUTE S3
IC803
COPY
PROHIBITING
AUTO PB MUTE
PB MUTING
16 bit
14 bit
REC MUTE
EMPHASIS
FLT DRIVE IC802
COPY
PROHIBITING
AUTO PB MUTE
PB MUTE
16 bit
14 bit
REC MUTE
EMPHASIS
(FILAMENT)
POWER TRANSFORMER T1
SWITCHING Q530–532
POWER ON MUTE
VL 1
VH 1
VH2
VL 2
A/D CONVERTER IC302
BCK
CC
REC DATA
E CLK
IC309
X301 84.672MHz
IC504
VIDEO AMP Q505,506
VIDEO AMP Q503,504
VIDEO OUT CNJ303
COPY OUT CNJ304
SWITCHING IC650
DATA SWITCH IC651 Q650,651
LINE MUTE
+11V
RIPPLE FILTER Q305
+12V
REG Q301~304
+5V
REG IC306
RECT D90J–904
–12V
REG Q306–309
–5V
REG IC307
AC IN
POWER S1
+24V
REG Q904
RECT Q913,914
+5V
REG Q902
RECT D905–908
REG IC901
RECT D909–912
–5V
REG Q903
–5V
REG IC904
POWER ON MUTE
SWITCH Q905–907

SECTION 2
DISASSEMBLY

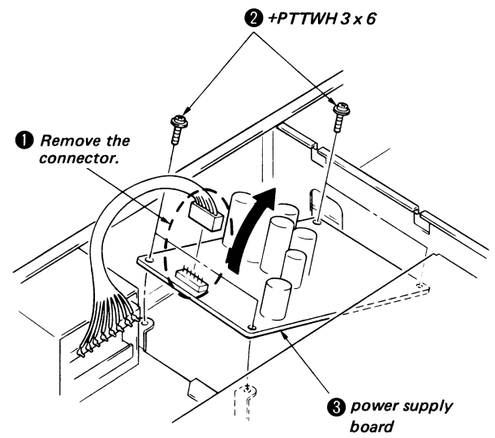
- Follow the disassembly procedure in the numerical order given.

- **Remove the case.**
- **Remove the bottom plate.**

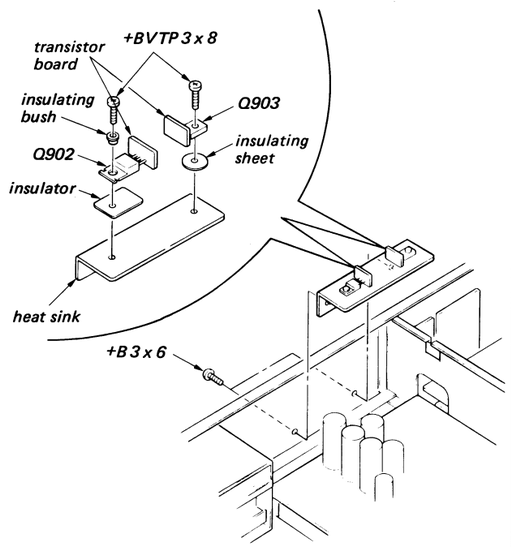
DIGITAL BOARD



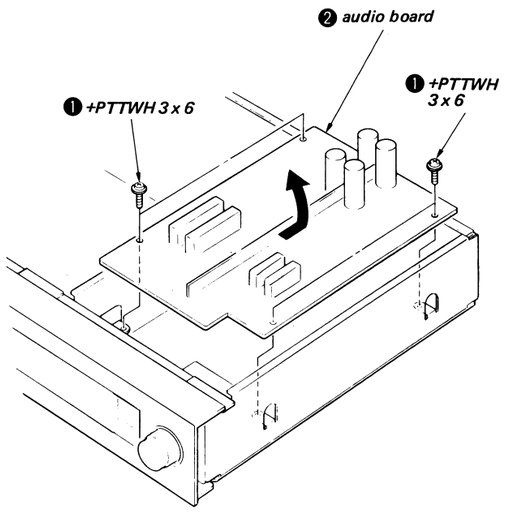
POWER SUPPLY BOARD



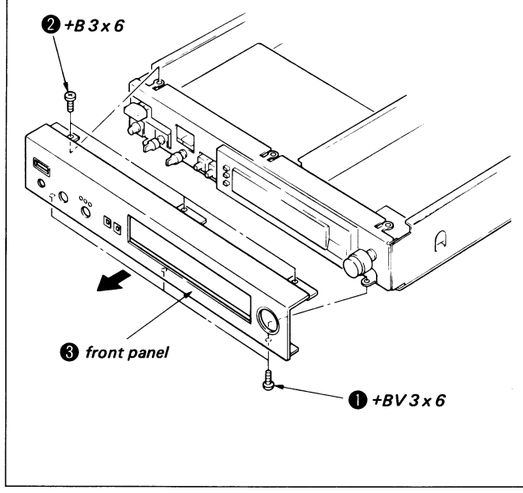
TRANSISTOR BOARD



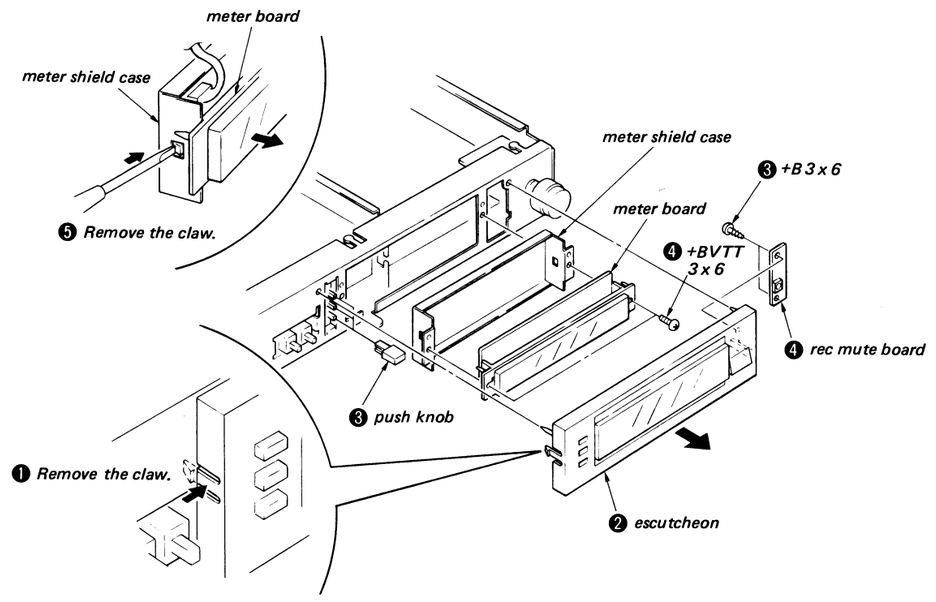
AUDIO BOARD



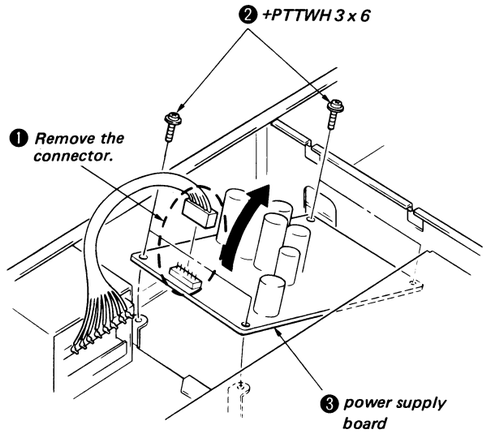
FRONT PANEL



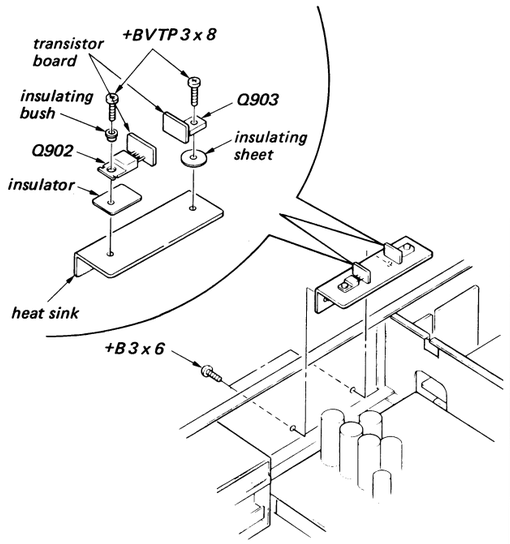
METER BOARD



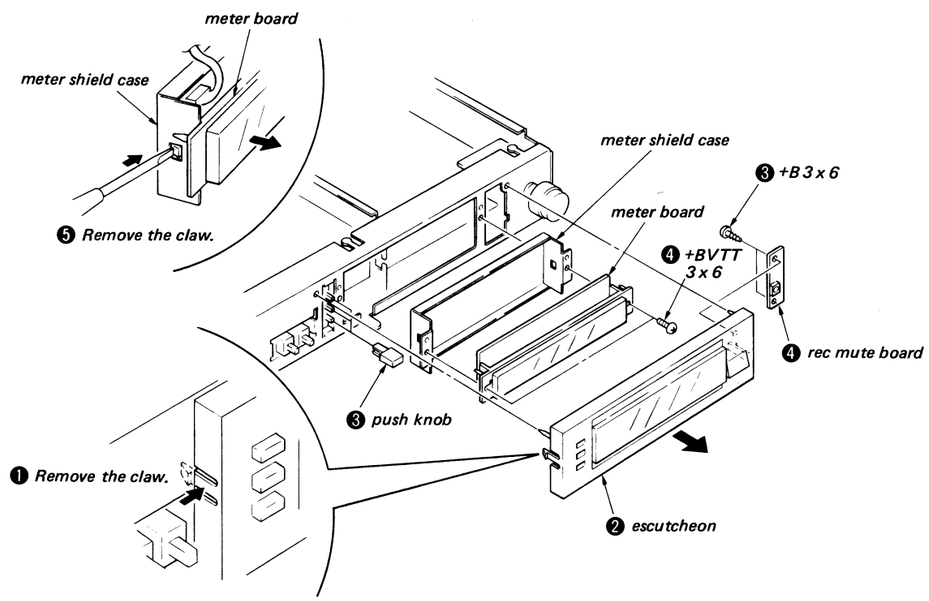
POWER SUPPLY BOARD



TRANSISTOR BOARD



METER BOARD



SECTION 3
ADJUSTMENTS

- Switch Position

PB MUTING	ON
COPY	OFF
TRACKING	OFF
REC RESOLUTION	16 bit
HEADPHONES LEVEL	MAX
OVC control	center click

- E-E mode: VIDEO-IN and VIDEO-OUT terminals are connected.

- Reference input level

Input terminal	LINE IN	VIDEO IN
Source impedance	10 kΩ	75 Ω
Signal input level	0.24 V (–10 dB)	1 Vp-p

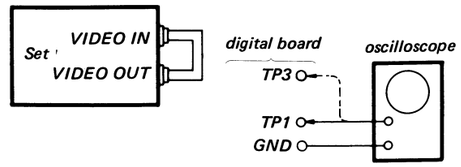
- Reference output level

Output terminal	LINE OUT	VIDEO OUT
Load impedance	47 kΩ	75 Ω
Signal output level	0.24 V (–10 dB)	1 Vp-p

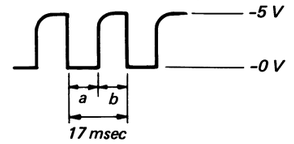
Make an adjustment after turning POWER ON more than half an hour so that the drift by temperature rise is avoided.

VCO ADJUSTMENT

Procedure:

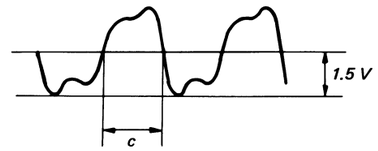


1. Connect VIDEO-IN and VIDEO-OUT terminals, and connect the oscilloscope to the VCO check point and ground point.
2. Adjust L501 so that duty factor is 50%.



duty factor 50%: a/b = 1/1

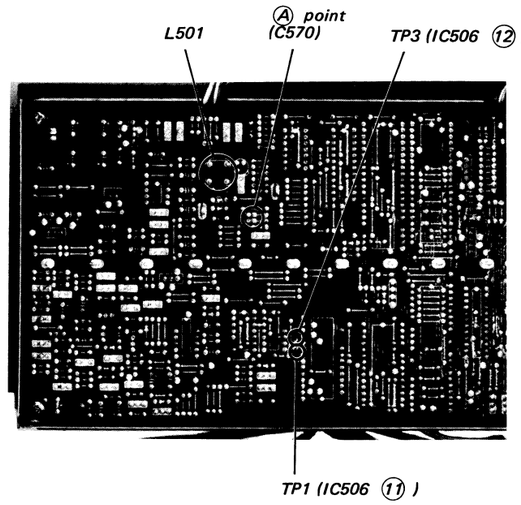
3. Turn the COPY switch to OFF→ON→OFF and then confirm the duty factor is 50%.
4. Connect the oscilloscope to TP3.
5. Confirm the duty factor is as shown below.



C: less than 0.02μsec.

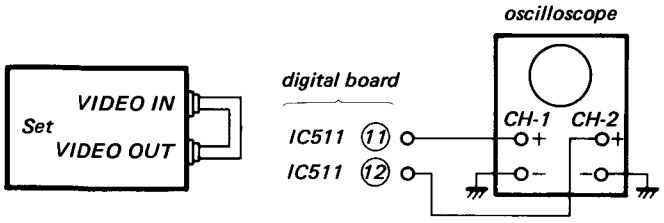
6. If c is 0.02μsec or more, solder the point Ⓐ.

Adjustment Location: digital board



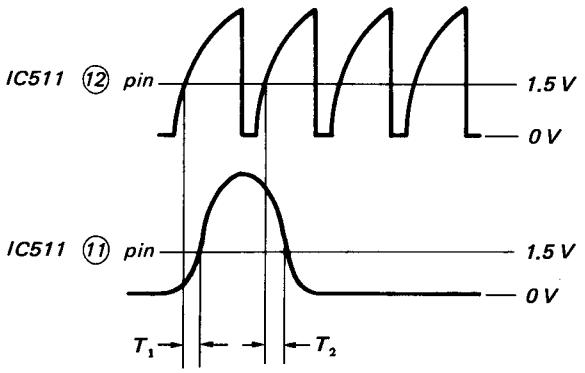
SKEW ADJUSTMENT

Procedure:



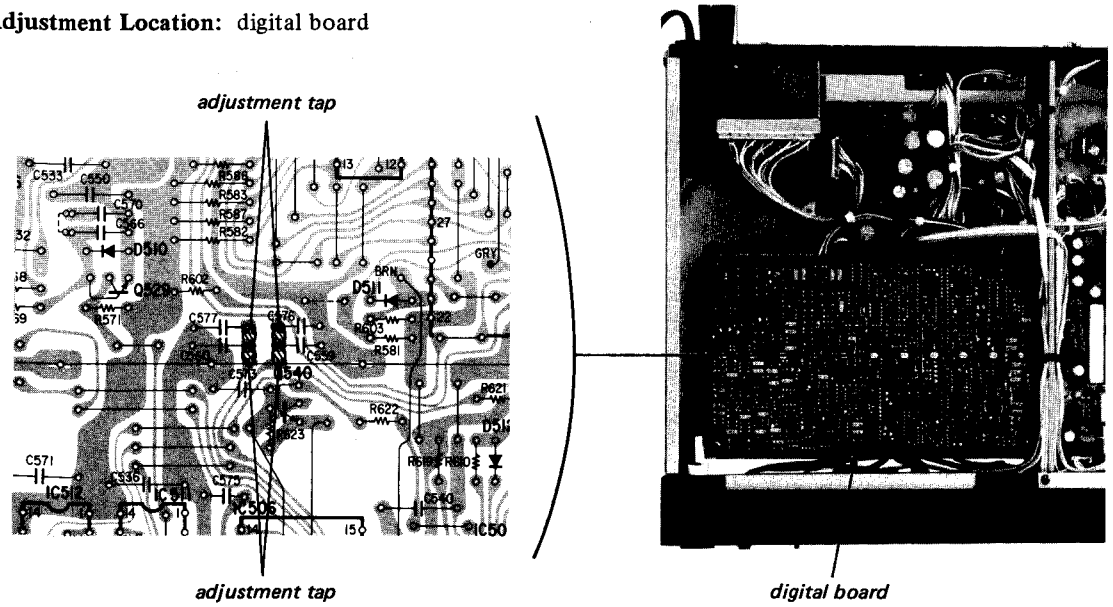
1. Connect VIDEO-IN and VIDEO-OUT terminals.
2. Connect the oscilloscope to IC511 (11) pin and (12) pin.
3. Solder or unsolder the adjustment taps so that T_1 and T_2 is more than 10nsec.

waveform:



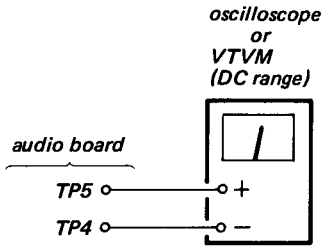
T_1 and T_2: more than 10nsec.

Adjustment Location: digital board



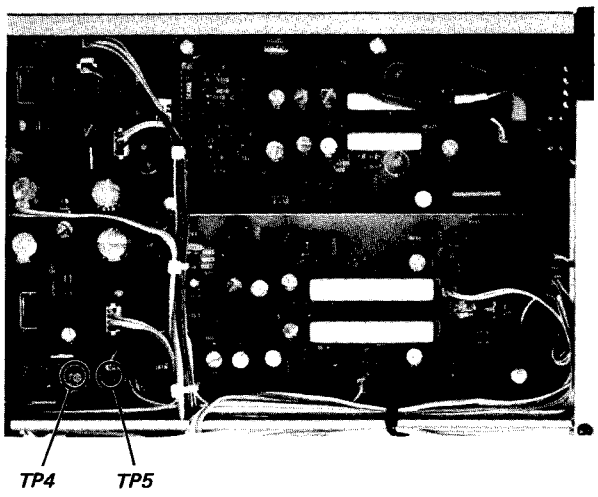
-5 V ADJUSTMENT

Procedure:

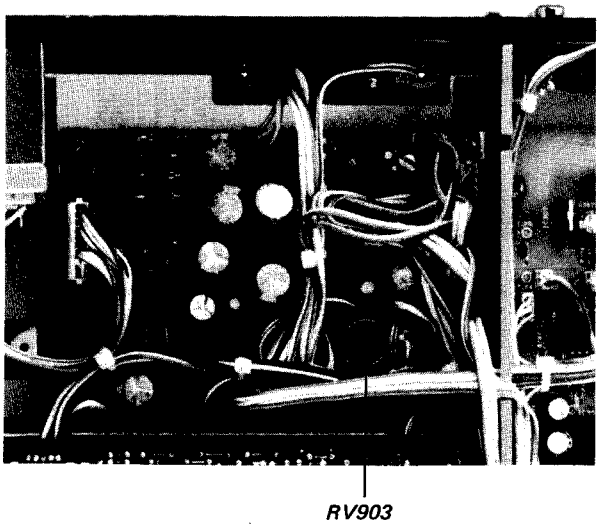


1. Connect the oscilloscope or VTVM (both are DC range) to the TP-4 and TP-5.
2. Adjust the RV903 so that the oscilloscope or VTVM reading are 0±10 mV.

Connecting Point: audio board

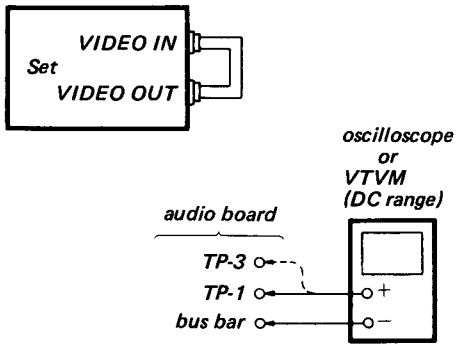


Adjustment Location: power supply board



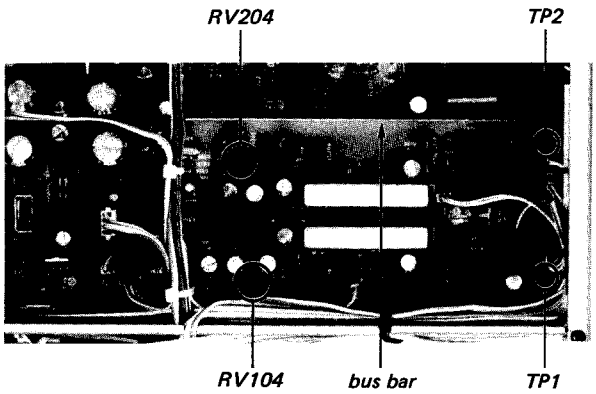
D/A OFFSET ADJUSTMENT

Procedure:

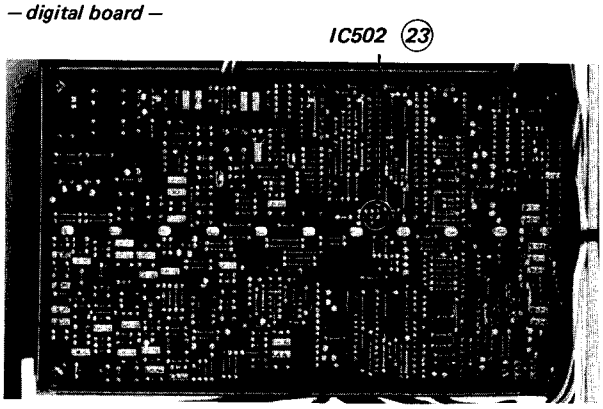


1. Connect the IC502 pin (23) to the ground. [The no signal data is fed to D/A converter (IC301).]
2. Connect VIDEO-IN and VIDEO-OUT terminals, and connect the oscilloscope or VTVM (both are DC range) to the test point TP-1 (L-CH)/TP-3 (R-CH) and bus bar (ground point).
3. Adjust the RV104 (L-CH)/RV204 (R-CH) so that the oscilloscope or VTVM reading are 0±10 mV.

Adjustment Location: audio board



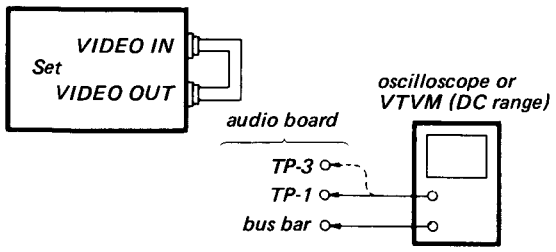
– digital board –



A/D OFFSET ADJUSTMENT

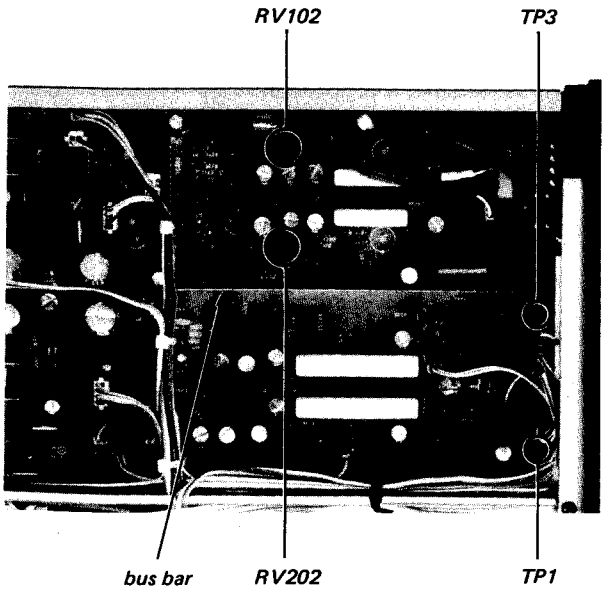
- A/D OFFSET ADJUSTMENT should be made later than that of D/A OFFSET.

Procedure:



1. Connect VIDEO-IN and VIDEO-OUT terminals, and connect the oscilloscope or VTVM (both are DC range) to test point TP-1 (L-CH)/ TP-3 (R-CH) and bus bar (ground point).
2. Turn the REC LEVEL control to the minimum (0).
3. Adjust the RV102 (L-CH)/RV202 (R-CH) so that the oscilloscope or VTVM reading are 0±5 mV.

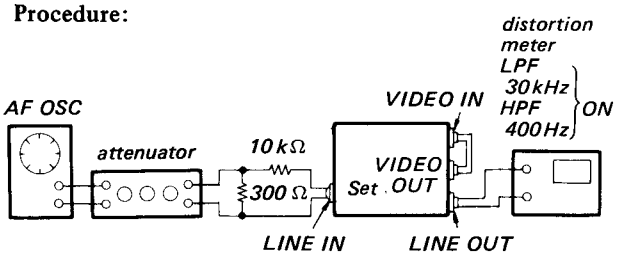
Adjustment Location: audio board



A/D DISTORTION ADJUSTMENT

- The low distortion AF OSC and the low distortion measurement equipment are needed to make this adjustment.

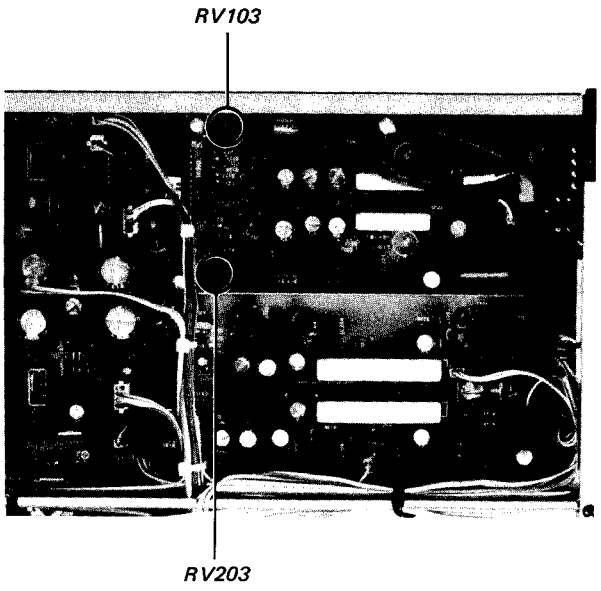
Procedure:



1. Connect VIDEO-IN and VIDEO-OUT terminals.
2. Apply a 1 kHz, 0 dB (0.775 V) signal to LINE-IN and connect the distortion meter to LINE-OUT.
3. Adjust the REC LEVEL control so that OVER of the level meters just light up.
4. Decrease the input signal level from 0.5 to 1 dB with the attenuator, and confirm OVER of that goes out.
5. Adjust the RV103 (L-CH)/RV203 (R-CH) for minimum reading on distortion meter.

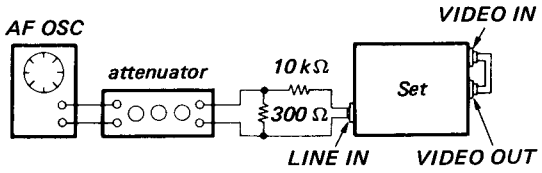
   specification: less than -85 dB

Adjustment Location: audio board



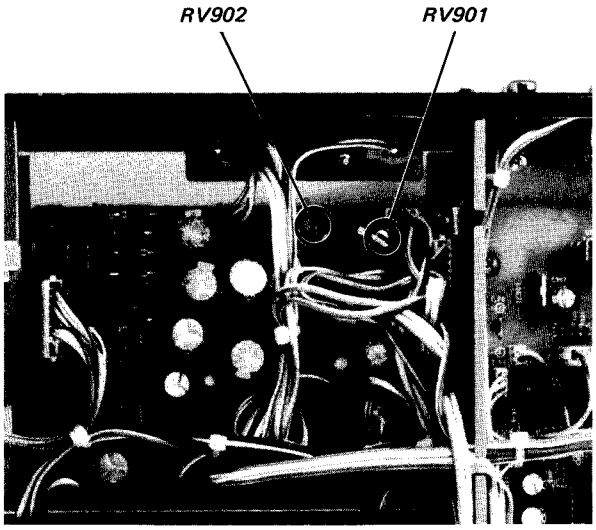
PEAK METER ADJUSTMENT

Procedure:



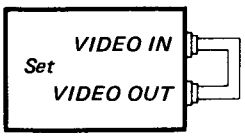
1. Connect VIDEO-IN and VIDEO-OUT terminals.
2. Apply a 1 kHz, 0 dB (0.775 V) signal to the LINE-IN terminals.
3. Adjust the REC LEVEL control so that OVER of the level meters just light up.
4. Decrease the input signal level from 0.5 to 1 dB with the attenuator, and confirm OVER of that goes out.
5. Adjust the RV901 (L-CH)/RV902 (R-CH) so that the level meters just light up 0 dB.

Adjustment Location: power supply board

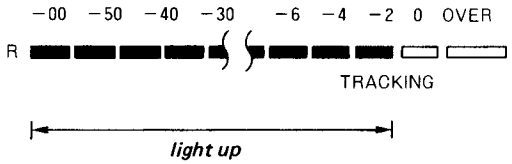


TRACKING LEVEL ADJUSTMENT

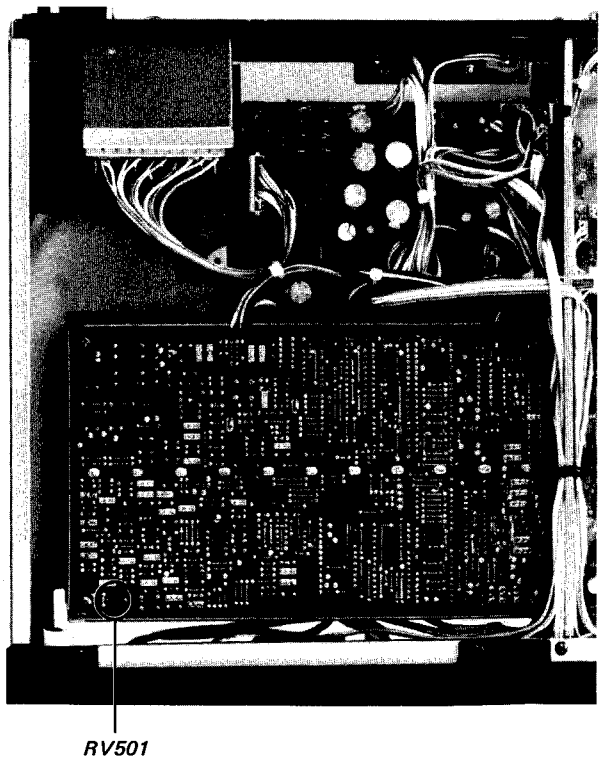
Procedure:



1. Connect VIDEO-IN and VIDEO-OUT terminals.
2. Turn on the TRACKING switch.
3. Confirm the TRACKING indicator illuminates and the level meter illuminates only R-CH.
4. Adjust the RV501 so that the level meter illuminates as shown below.



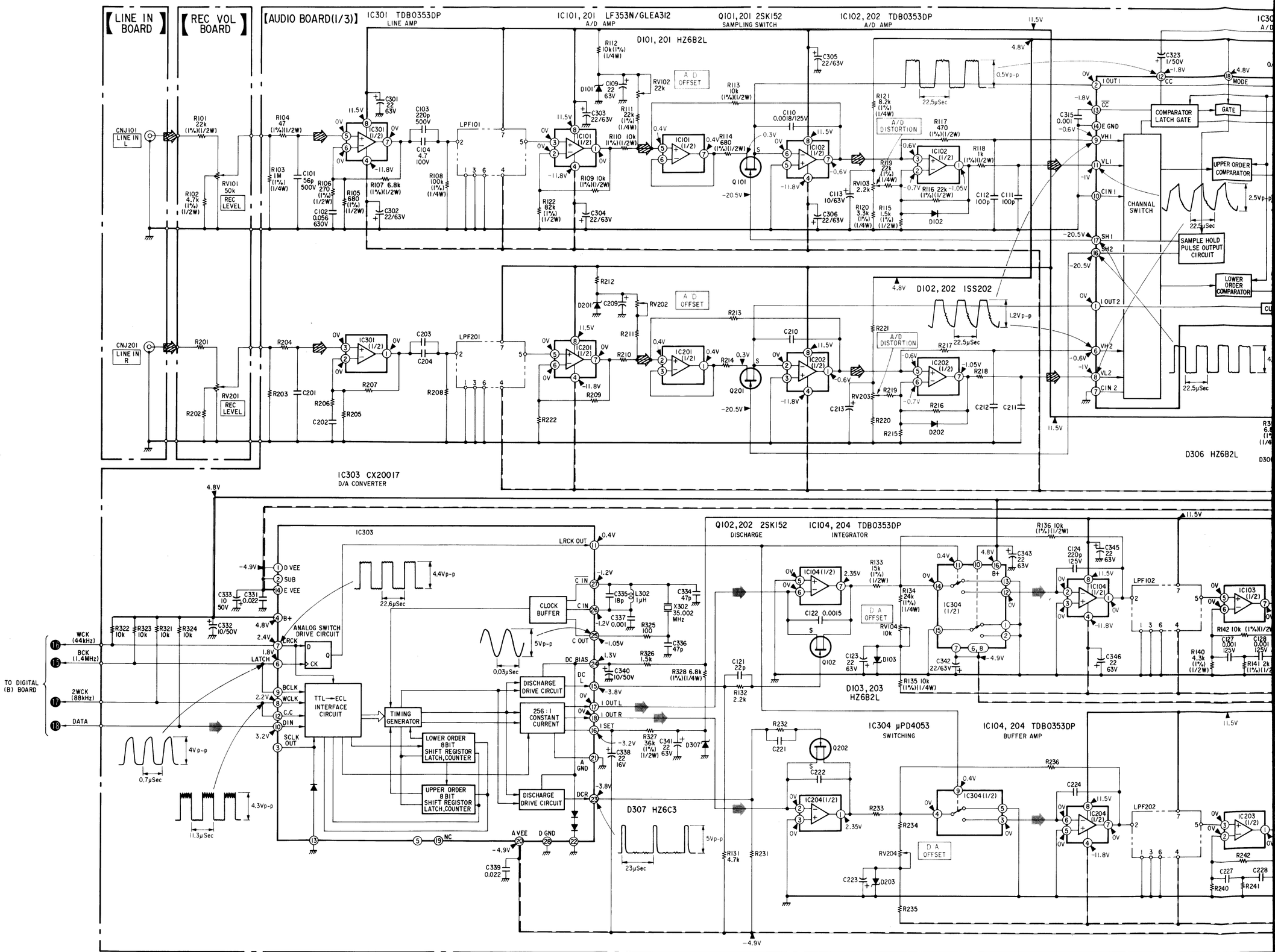
Adjustment Location: digital board



SECTION 4
DIAGRAMS

4-1. SCHEMATIC DIAGRAM

– Audio Section –



IC302 CX20018
A/D CONVERTER

IC309 SN74LS02N
SHAPER

R311 4.7k
WCK (44kHz) → 11 TO DIGITAL(B) BOARD

IOM → 12 TO DIGITAL(A) BOARD

39 DIGITAL SECTION TO AUDIO BOARD

DATA → 13

BCK (1.4MHz) → 14

TO DIGITAL(B) BOARD

L301 0.47μH
C321 12p
X301 84.672MHz
C320 4.7p
C322 10/50V
C323 1/50V
R313 2.7k
R318 100k
R312 1k
C326 0.001
C319 0.001
C325 22p
R319 8.2k

IOUT1 · CC · E GND · VH1 · VL1 · CIN1 · SH1 · SH2 · IOUT2 · VH2 · VL2 · CIN2

COMPARATOR LATCH GATE · GATE · CLOCK GATE · CLOCK BUFFER · DIVIDER CIRCUIT · UPPER ORDER COMPARATOR · CHANNAL SWITCH · SAMPLE HOLD PULSE OUTPUT CIRCUIT · TIMING CIRCUIT · LOWER ORDER COMPARATOR · CURRENT REG SOURCE

MODE · CLK OUT · CLK IN · B+ · fmclk N

UPPER ORDER 9BIT COUNTER SHIFT REGISTOR · ECL→TTL INTERFACE · LOWER ORDER 7BIT COUNTER SHIFT REGISTOR · TTL→ECL INTERFACE

D OUT · A GND · E GND · T GND · BCLK · ISET · A VEE · CONTROL PIN · E VEE

2.5Vp-p · 22.5μSec · 4.3Vp-p · 5.1Vp-p · 0.7μSec

C316 22/16V · C317 10/16V · R309 39k (1%) (1/2W) · TP4 VOLTAGE ADJ · C318 0.022

IC307 NJM79M05A
REG

R310 6.8k (1%) (1/4W) · TP5 VOLTAGE ADJ · D306 HZ6B2L · C324 22/63V · C357 220 16V

IC306 NJM78M05A
REG

C356 220 16V

Q301 2SD414, Q302, 303 2SC2676 — REG
Q304 2SK120 Q305 2SD809 — CONSTANT CURRENT RIPPLE FILTER

R316 150 (1/2W)

Q301 · Q302 · Q303 · Q304 · Q305

R301 1k (1%) (1/2W) · R305 10k (1%) (1/4W) · C309 330 63V · C358 15p 500V · R302 1.2k (1%) (1/2W) · C311 22 63V · D305 · C313 2200 25V · C308 100 16V · C307 1000 16V · RI 2.2 (1/4W)

D304, 305 HZ6B2L

R303 1.2k (1%) (1/2W) · C312 22 63V · D304 · C310 330 63V · C359 15p 500V · R304 1k (1%) (1/2W) · R306 10k (1%) (1/4W) · C314 2200 25V · Q306 · Q307 · Q308 · Q309

Q306 2SB548, Q307,308 2SA1138 — REG
Q309 2SK120 — CONSTANT CURRENT

-5V → 3 TO POWER SUPPLY BOARD
+12V → 37 TO DIGITAL(A) BOARD
+18V → 4
+11V → 6
GND → 7
-18V → 8
-12V → 38 TO DIGITAL(A) BOARD
TO POWER SUPPLY BOARD

IC103, 203 NE5532P
LINE AMP

【LINE OUT BOARD(1/2)】

LPF102 · LPF202 · IC104 (1/2) · IC103 (1/2) · IC204 (1/2) · IC203 (1/2)

C124 220p 125V · C345 22 63V · C346 22 63V · C347 22 63V · C348 22 63V · C127 0.001 125V · C128 0.001 125V · C141 2k (1%) (1/2W) · C142 10k (1%) (1/2W) · C129 0.0039 630V · C130 4.7/100V · C131 220p 500V · C224 · C227 · C228 · C229 · C230 · C231 · C240 · C241

R140 4.3k (1%) (1/2W) · R143 12k (1%) (1/2W) · R144 36k (1%) (1/2W) · R145 3.9k (1%) (1/2W) · R146 1M (1%) (1/4W) · R147 100k (1%) (1/4W) · R148 150 (1%) (1/2W) · R154 220 (1%) (1/2W) · R242 · R243 · R244 · R245 · R246 · R247 · R248

TP1 OFF SET · TP2 GND · TP3 OFF SET

CNJ102 LINE OUT L · CNJ202 LINE OUT R

【HEADPHONE BOARD】

IC305 M5218L
HEADPHONE AMP

R149 33k (1%) (1/4W) · RV105 20k LEVEL · R150 820 (1%) (1/4W) · R151 6.8k (1%) (1/4W) · R152 100k (1%) (1/4W) · R153 220 (1%) (1/4W) · J301 HEADPHONES · C351 0.022

【LINE OUT BOARD(1/2)】

R330 10Ω (1/4W) · C349 100 16V · R253 · R249 · RV205 LEVEL · R252 · R250 · R251 · R329 10Ω (1/4W) · C350 100 16V

【AUDIO BOARD(1/3)】

IC308 M5218L
METER AMP

R138 100k · R155 2.2k · R238 · R255

METER R-CH · METER L-CH → 10 9 TO POWER SUPPLY BOARD

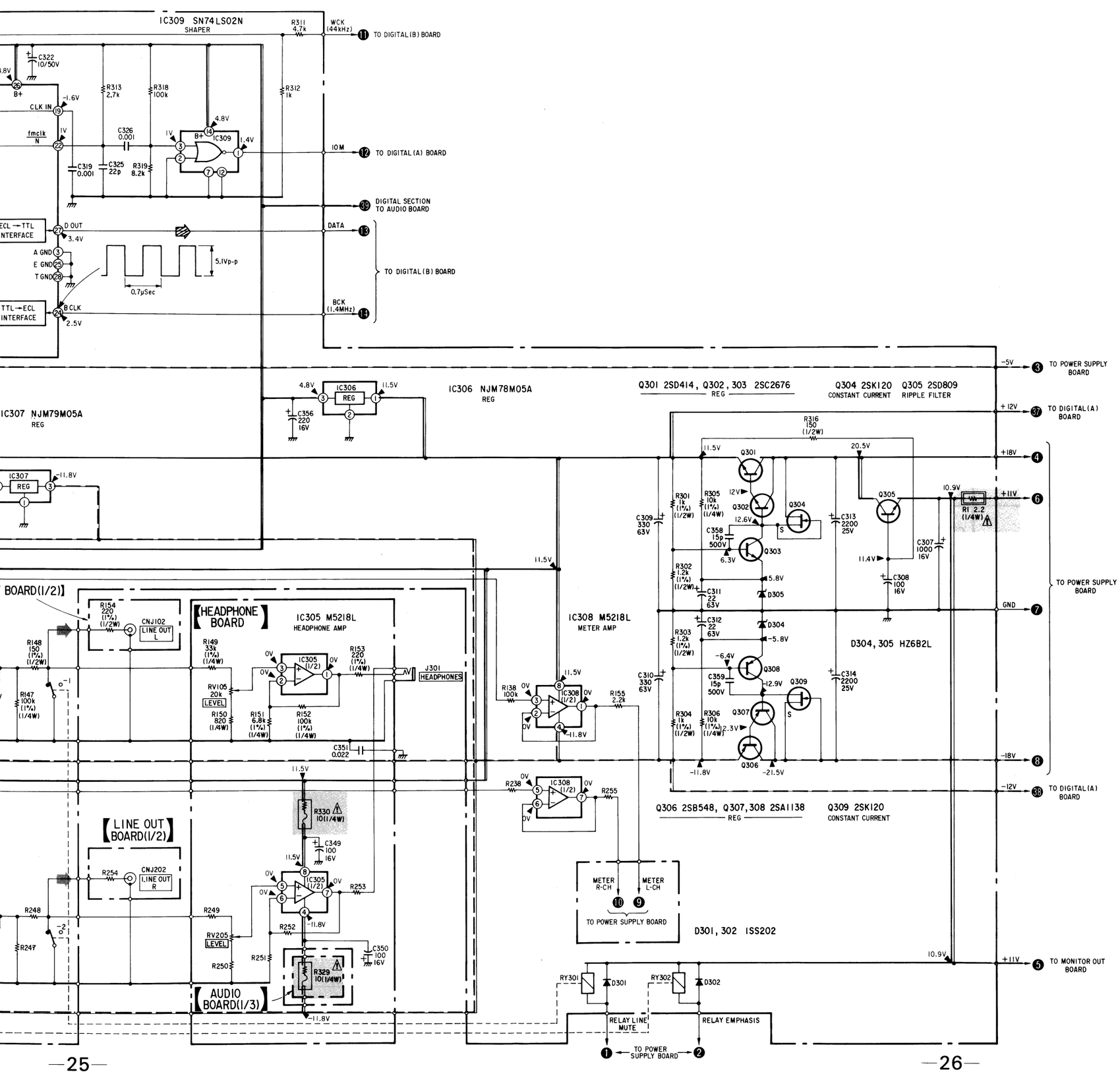
D301, 302 1SS202

RY301 · D301 · RY302 · D302

RELAY LINE MUTE · RELAY EMPHASIS

1 ← TO POWER SUPPLY BOARD → 2

10.9V → +11V → 5 TO MONITOR OUT BOARD



Note:

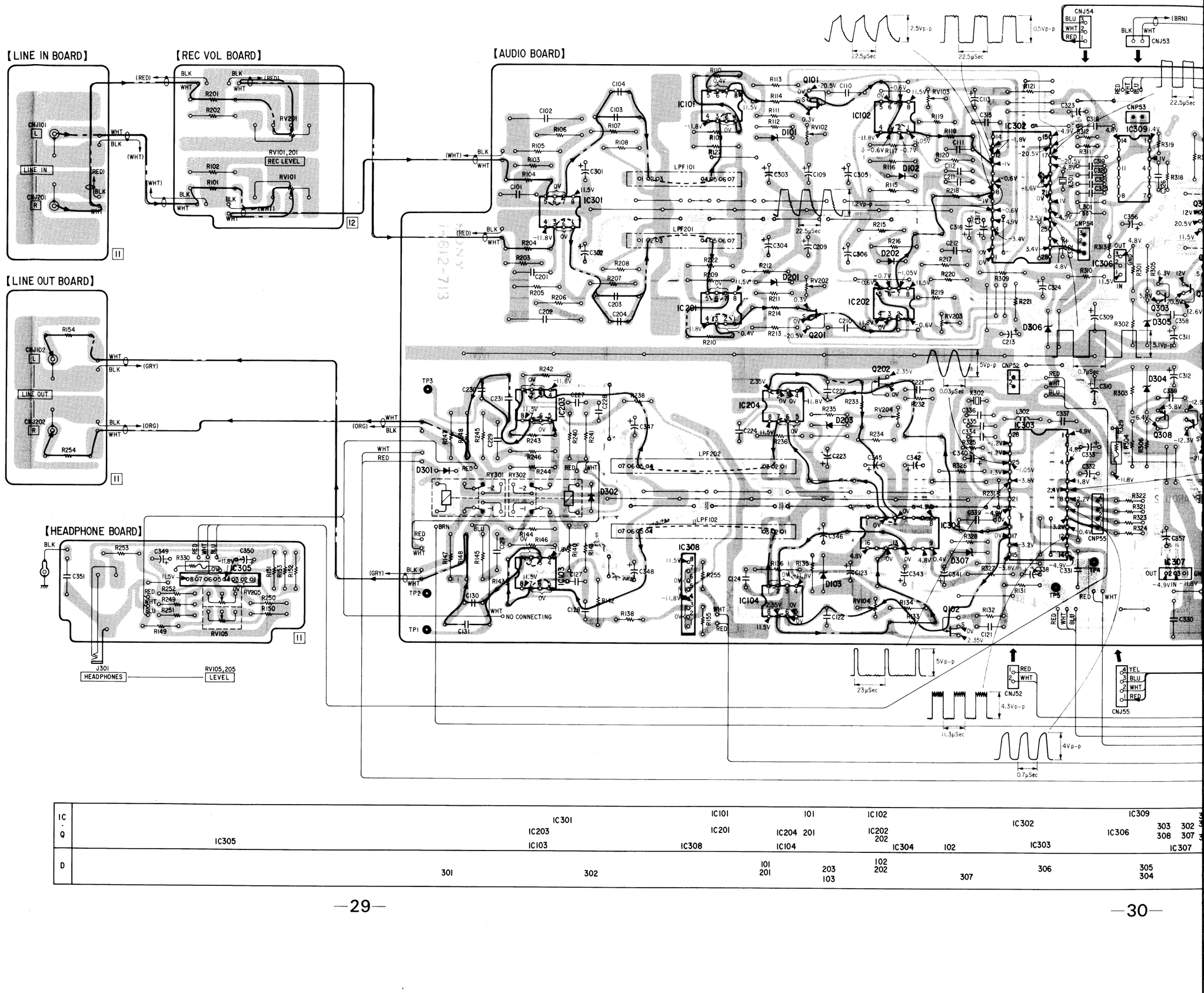
- All capacitors are in μF unless otherwise noted. pF: μμF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- : signal path. (playback)
- : signal path. (recording)
- : nonflammable resistor.
- : fusible resistor.
- : B+ bus.
- : B- bus.
- : adjustment for repair.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under no-signal conditions with a VOM (50 kΩ/V).
- Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken to ground in E-E mode by using oscilloscope. Voltage variations may be noted due to normal production tolerances.

Note: Voltages are measured with a VOM (50kΩ/V).

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

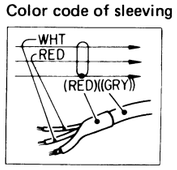
4-2. MOUNTING DIAGRAM

– Audio & Digital Section –



Note:

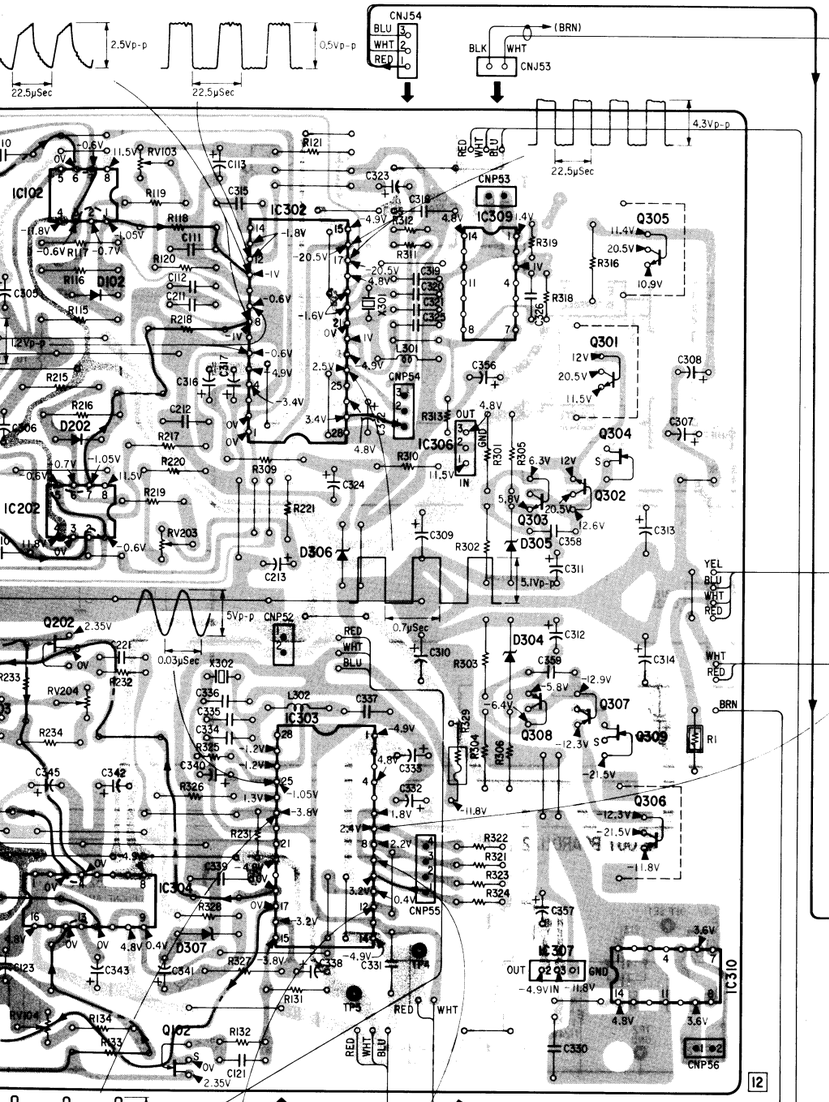
- Color code of sleeving over the end of the jacket.

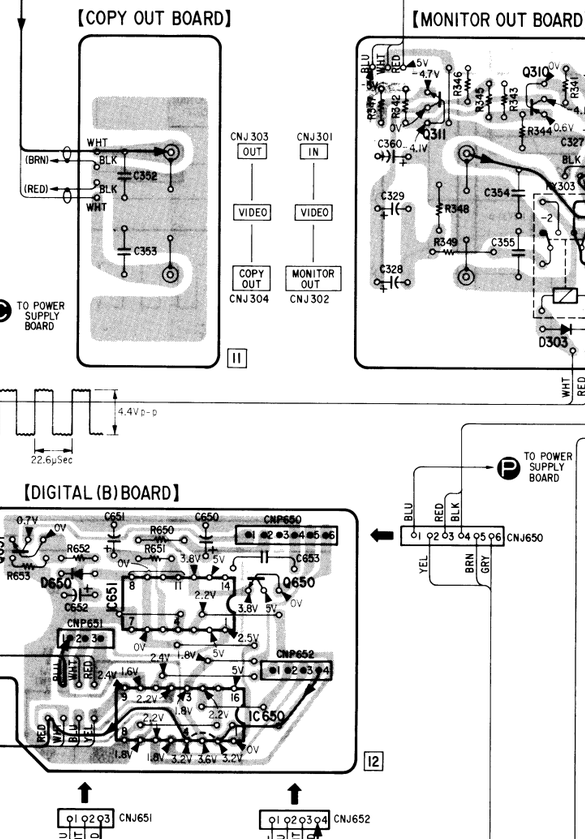


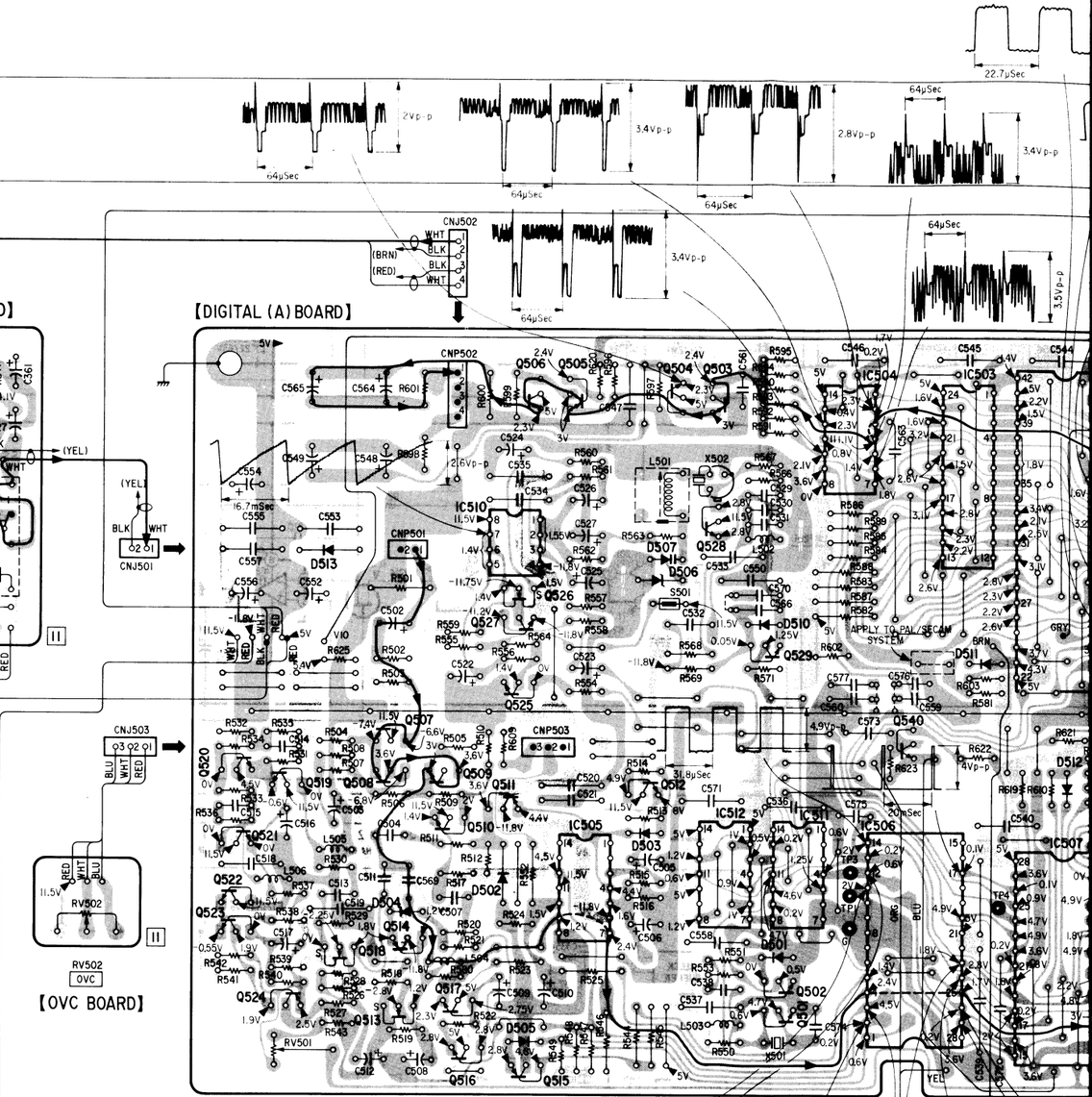
- ○— : parts extracted from the component side.
- ●— : parts extracted from the conductor side.
- [ ]— : indicates side identified with part number.
- —→— : signal path
- —→— : L-CH signal path
- —→— : R-CH signal path
- ▒▒ : B+ pattern

IC · Q	IC305	IC301 IC203 IC103	IC101 IC201 IC308	101 IC204 201 IC104	IC102 IC202 202 IC304	102	IC302 IC303	307	IC309 IC306	303 302 308 307 IC307
D	301	302	101 201	203 103	102 202		306		305 304	

13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29

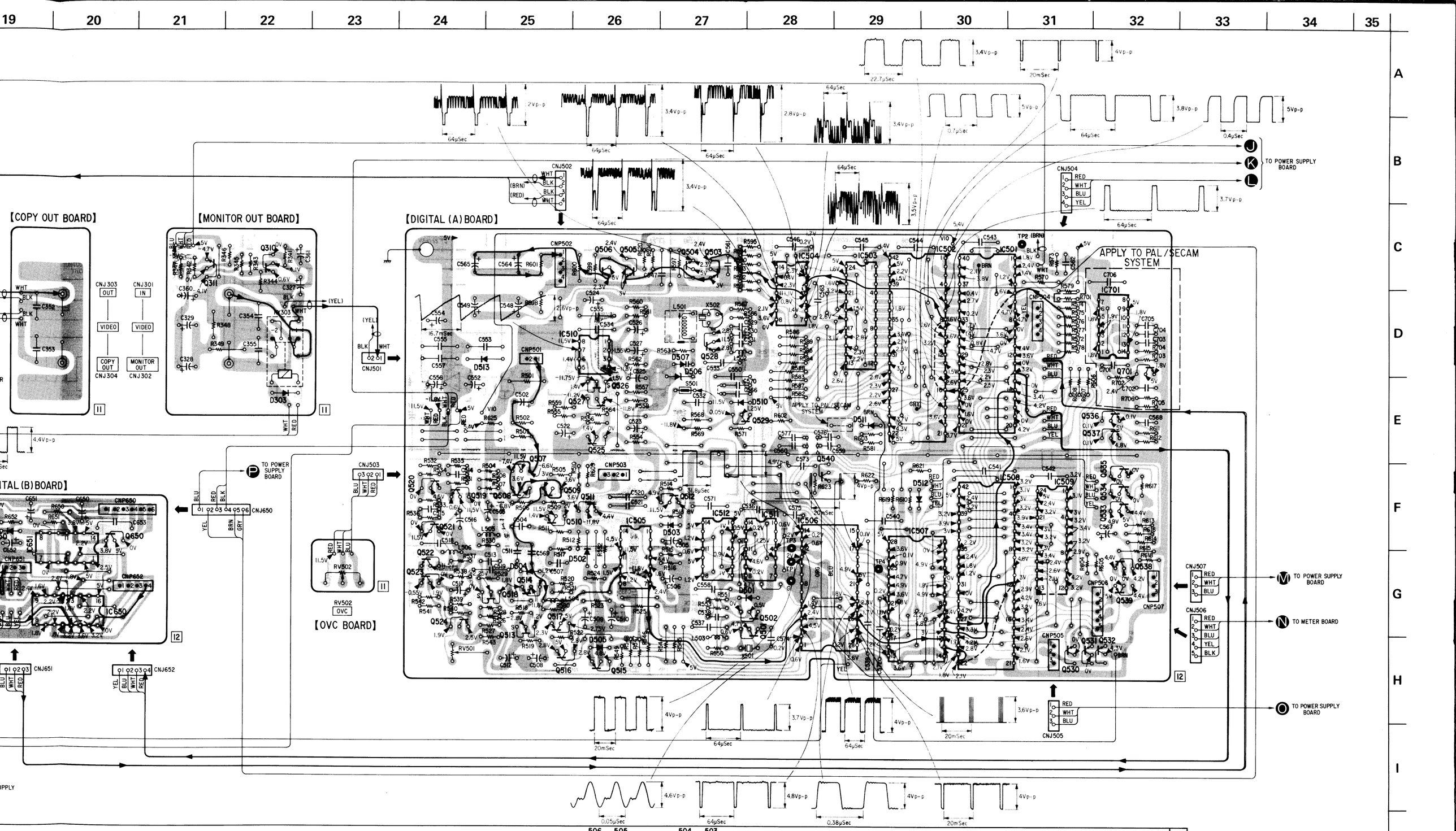






IC・Q	IC102	IC202 202	IC304	102	IC302	IC303	IC306	IC309	303	302	301	304	308	307	309	IC307	305	306	IC310
D		102 202		307		306		305 304											

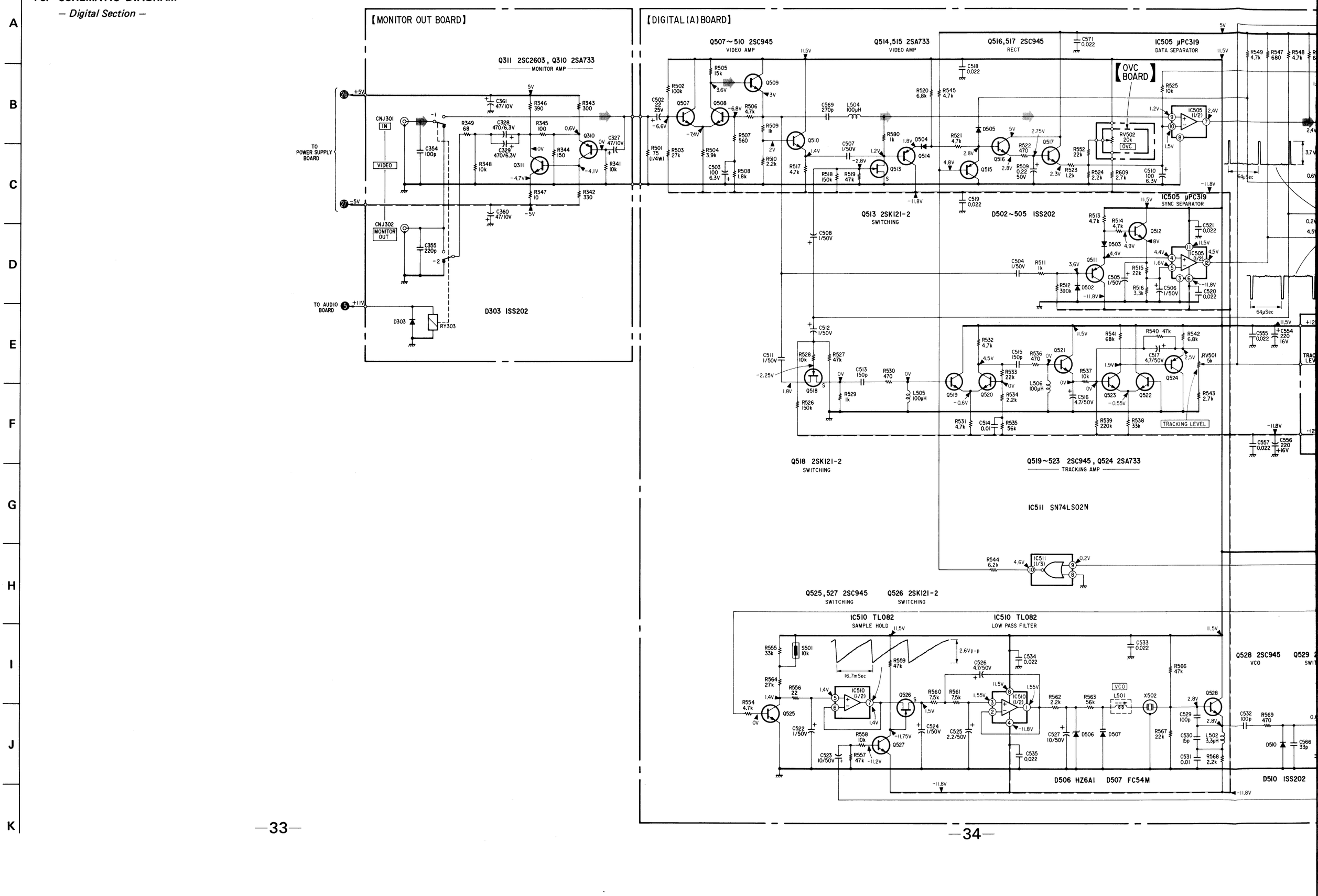
IC・Q	651	IC651 IC650	650	311	310	520 521 522 523	519	524	518	507 508	514	513	509 510	517	516	511	IC510	506	505	526 527 525	515	IC505	504	503	512	528	IC512	529	502 501	IC511	540	IC504	IC506	IC503	IC507	IC502
D	650			303				513		504									502 505					507 506 503		510	501			511					512


【COPY OUT BOARD】
【MONITOR OUT BOARD】
【DIGITAL (A) BOARD】
【DIGITAL (B) BOARD】
【OVC BOARD】
APPLY TO PAL/SECAM SYSTEM
TO POWER SUPPLY BOARD
TO METER BOARD
CNJ303 OUT VIDEO COPY OUT CNJ304
CNJ301 IN VIDEO MONITOR OUT CNJ302
CNJ501
CNJ502
CNJ503
CNJ504
CNJ505
CNJ506
CNJ507
CNJ650
CNJ651
CNJ652
RV501
RV502
CNP501
CNP502
CNP503
CNP504
CNP505
CNP506
CNP507
CNP650
CNP651
CNP652
IC501
IC502
IC503
IC504
IC505
IC506
IC507
IC508
IC509
IC510
IC512
IC650
IC651
IC701
X501
X502
TP1
TP2
TP3
TP4
TP5
TP6
3.4Vp-p
22.7μSec
20mSec
4Vp-p
64μSec
2Vp-p
2.8Vp-p
0.7μSec
5Vp-p
3.8Vp-p
0.4μSec
3.7Vp-p
3.5Vp-p
4.4Vp-p
4.6Vp-p
4.8Vp-p
3.6Vp-p
0.05μSec
0.38μSec
16.7mSec
31.8μSec
2.6Vp-p

| | 311 | 310 | | |

4-3. SCHEMATIC DIAGRAM

— Digital Section —



IC506 CX7914
PLAYBACK SECTION SYNC SEPARATOR

IC505 μPC319
DATA SEPARATOR

【OVC BOARD】

IC505 μPC319
SYNC SEPARATOR

IC507 CX7975
DATA PROCESS

Q533~535 2SC945
LED DRIVE

Q540 2SC945
SKEW COMPENSATOR

【AUDIO BOARD(1/3)】

IC310 μPD4584BC
SHAPER

Q536 2SC945 Q537 2SC945
INTEGRATOR SWITCHING

IC508 TM4505P
PLAYBACK DATA PROCESS

IC509 MB8416A-15PSK
RAM

Q523 2SC945, Q524 2SA733
TRACKING AMP

IC511 SN74LS02N

Q501,502 2SC2724
OSC

IC512 SN74LS74AN
D FLIP-FLOP

Q528 2SC945 Q529 2SC2724
VCO SWITCHING

D506 HZ6AI D507 FC54M

D510 ISS202

D501 ISS202

D512 ISS202

Q533~535 2SC945
LED DRIVE

Q533 4.4V
Q534 0V
Q535 0V

R616 220
R617 220
R618 1k

TO LED BOARD
TO METER BOARD
AUTO PB MUTE
PB MUTING

Q540 2SC945
KEW COMPENSATOR

R622 100k

BOARD (1/3)

TO AUDIO BOARD

C573 0.0047

D512 ISS202

Q536 2SC945 INTEGRATOR
Q537 2SC945 SWITCHING
Q538,539 2SA733 SWITCHING

R613 4.7k
C567 10/50V
R612 4.7k
R611 470
R614 100k
C568 0.01
R615 3.3k

9-11,36

IC508 TM4505P
PLAYBACK DATA PROCESS

IC509 MB8416A-15PSK
RAM

R606 4.7k

CNP652

C542 0.022

V-OUT
TEST
WD-CK2R
CS2
CS1
R/W

EXTERNAL MEMORY CONTROL SECTION

EXTERNAL MEMORY ADDRESS GENERATOR SECTION

AD-1 AD-2 AD-0 AD-3 AD-4 AD-5 AD-6 AD-7 AD-8 AD-9 AD-10

DECODER
SELECTOR
2048x8 (16384) RAM CELL

ALU
(ACC) ACCUMULATOR

DA-ST
GND

TP2

TO AUDIO BOARD 12 IOM
TO METER BOARD 29 COPY PROHIBITING
31 COPY
32 REC MUTE
TO POWER SUPPLY BOARD 24 EMPHASIS

C562 22p

R573 4.7k
R574 4.7k
R578 22k
R577 22k

TO AUDIO BOARD 13 DATA
18 DATA

TO POWER SUPPLY BOARD 26 LINE MUTE

【DIGITAL (B) BOARD】

Q651 2SC945 DATA SWITCHING
D650 ISS202
IC651 TC74HC86P DATA SWITCHING
Q650 2SC945 DATA SWITCHING

IC650 TC74HC157P SWITCHING

R652 10k (1/4W)
R653 100k (1/4W)
C652 1/50V
R651 4.7k (1/4W)
C651 4.7 50V
R650 2.2k (1/4W)
C650 4.7 50V
D511 ISS202

C653 0.022

BCK (1.4MHz) 14
CN55 WHT BCK(1.4MHz) 13
CN650 6
2WCK (88kHz) 17 TO AUDIO BOARD
CN54 BLU WCK (44kHz) 11
CN55 YEL WCK (44kHz) 16

22.7μSec
3.4Vp-p
0.7μSec
5Vp-p

R625 1K
C543 0.022
D513 ISS202

IC501 CX23017
DATA PROCESS

R579 22k
R573 4.7k
R574 4.7k
R578 22k
R577 22k

RIOM PIOM COPY
NDUB
COPY
REC MUTE
PEMP
PB DATA
REMP
R570 4.7k
A/D DATA
D/A DATA
44 KO
RWBC
R44K
EMPO

SYNCRO CTL

126 DIVIDER PHASE COMPARATOR 125 DIVIDER
PAL NTSC
1/4 DIVIDER
1/7.5 DIVIDER (RBC)
WBC RBC
TIMING RESET
T2

R581 22k
R575 22k
R576 22k
PCO
NTSC/PAL
APPLIED TO PAL /SECAM SYSTEM
I06 I07 I05
DUBN
14/16
RCTL

【2 KEY SWITCH BOARD】
S2
REC RESOLUTION
14bit
16bit

R605 22k
R604 22k
OV L
OV R
TIME CONSTANT COUNTER

Q531
Q530
SHIFT
PEDS
OVER L
OVER R
POWER ON MUTE

Q530~532 SWITCH
Q532
5Vp-p
0.4μSec

REC DATA
GND
OV I
VIN
DATA
SIFT
WHITE
COMP
RRBC

IC504 SN7406
BUFFER
IC504 (1/2)
R602 22k
R603 22k

IC502 μPD785C
REC. DATA PROCESS
EXIT DC
DATA
PEAK
IC502
B+
INT
TEST 1
TEST 3
RBC
TEST 2

C544 0.022
R589 10k
R588 10k
R587 10k
R582 10k
R583 10k
R584 10k

PEAK DETECTOR
ZERO DETECTOR
MUT
14/16 BIT CONVERTER
Q GEN.
P GEN.
14/16 DELAY
8 BIT SIPO
8 BIT SIPO
8 BIT BUFFER

D1 D2 D3 D4 D5 D6 D7 D8
4Vp-p
20mSec

8 BIT LATCH
CONTROL LATCH
15 BIT SR
7 BIT PISO
CRC ADDITION
3.8V p-p
64μSec

H ROM
COMPOSITE GENERATOR
SIFT
V
COMP
WHITE
DATA
64μSec

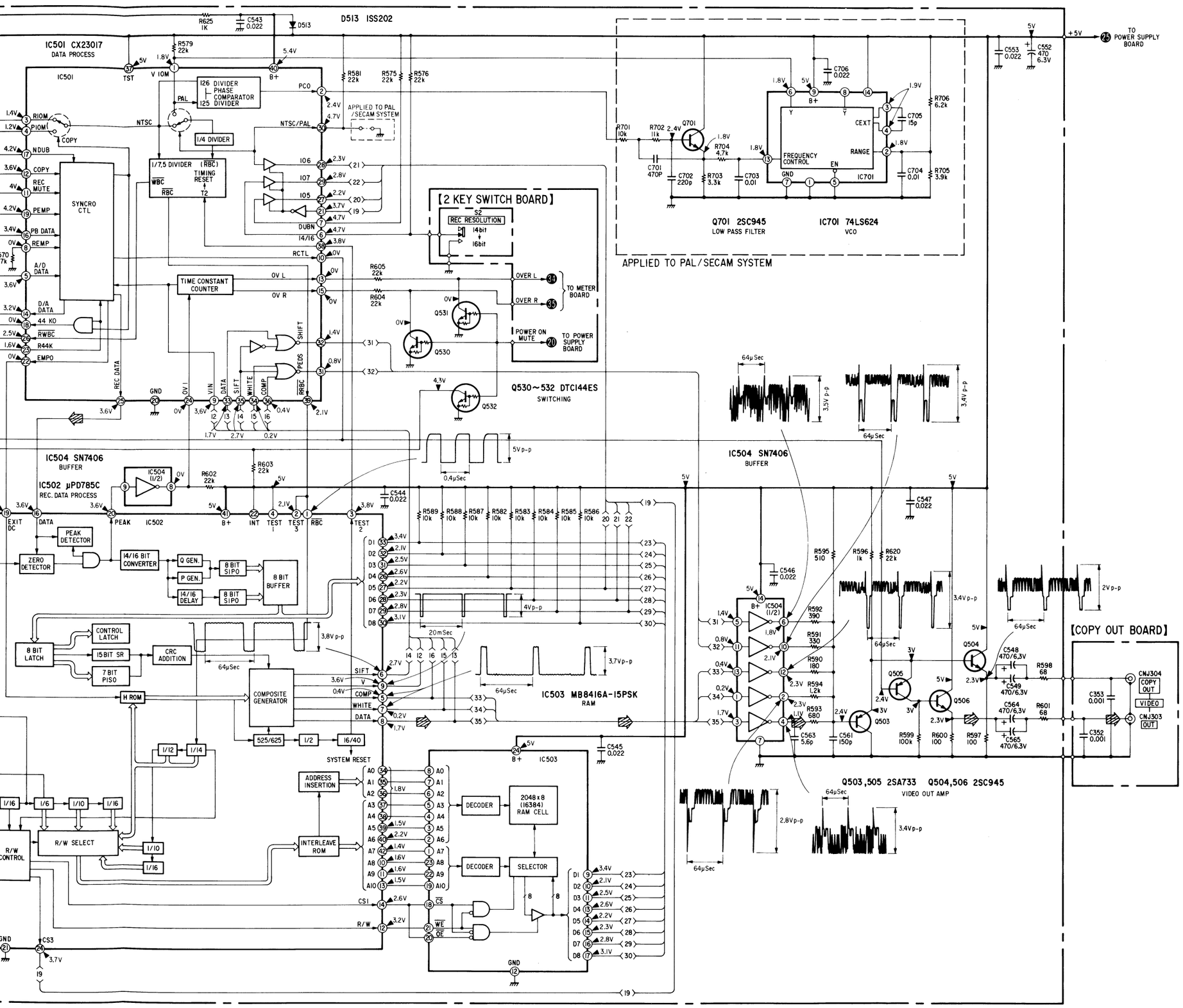
88K
44K
WBC
1/16
1/6
1/10
1/16
1/12
1/14
525/625
1/2
16/40
SYSTEM RESET

ADDRESS INSERTION
INTERLEAVE ROM

R/W CONTROL
CS2
R/W SELECT
1/10
1/16

A0 A1 A2 A3 A4 A5 A6 A7 A8 A9 A10
DECODER
SELECTOR
2048x8 (16384) RAM CELL
CS1
R/W
CS3
3.7V
GND

IC503



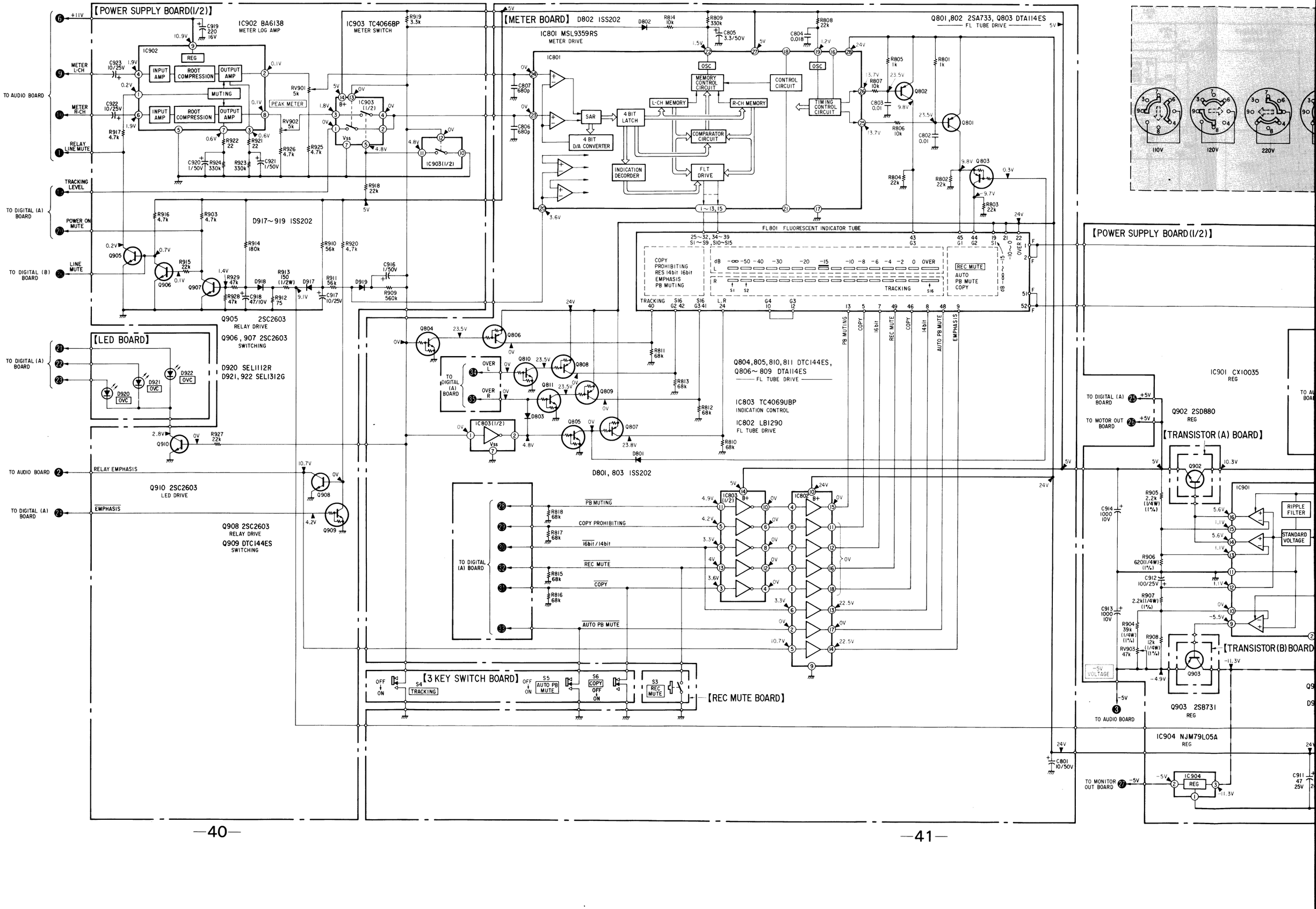
Note:

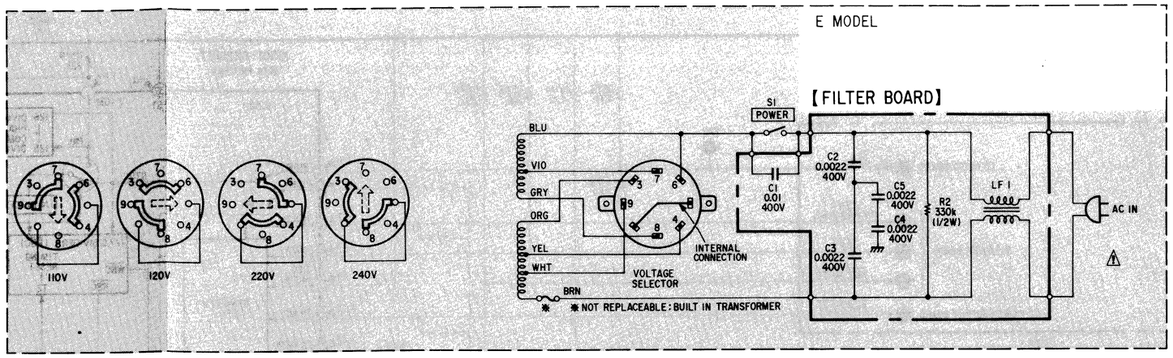
- All capacitors are in μF unless otherwise noted. pF: μμF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- : signal path. (playback)
- : signal path. (recording)
- : B+ bus.
- : B- bus.
- : adjustment for repair.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under no-signal conditions with a VOM (50 kΩ/V).
- Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken to ground in E-E mode by using oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Switch

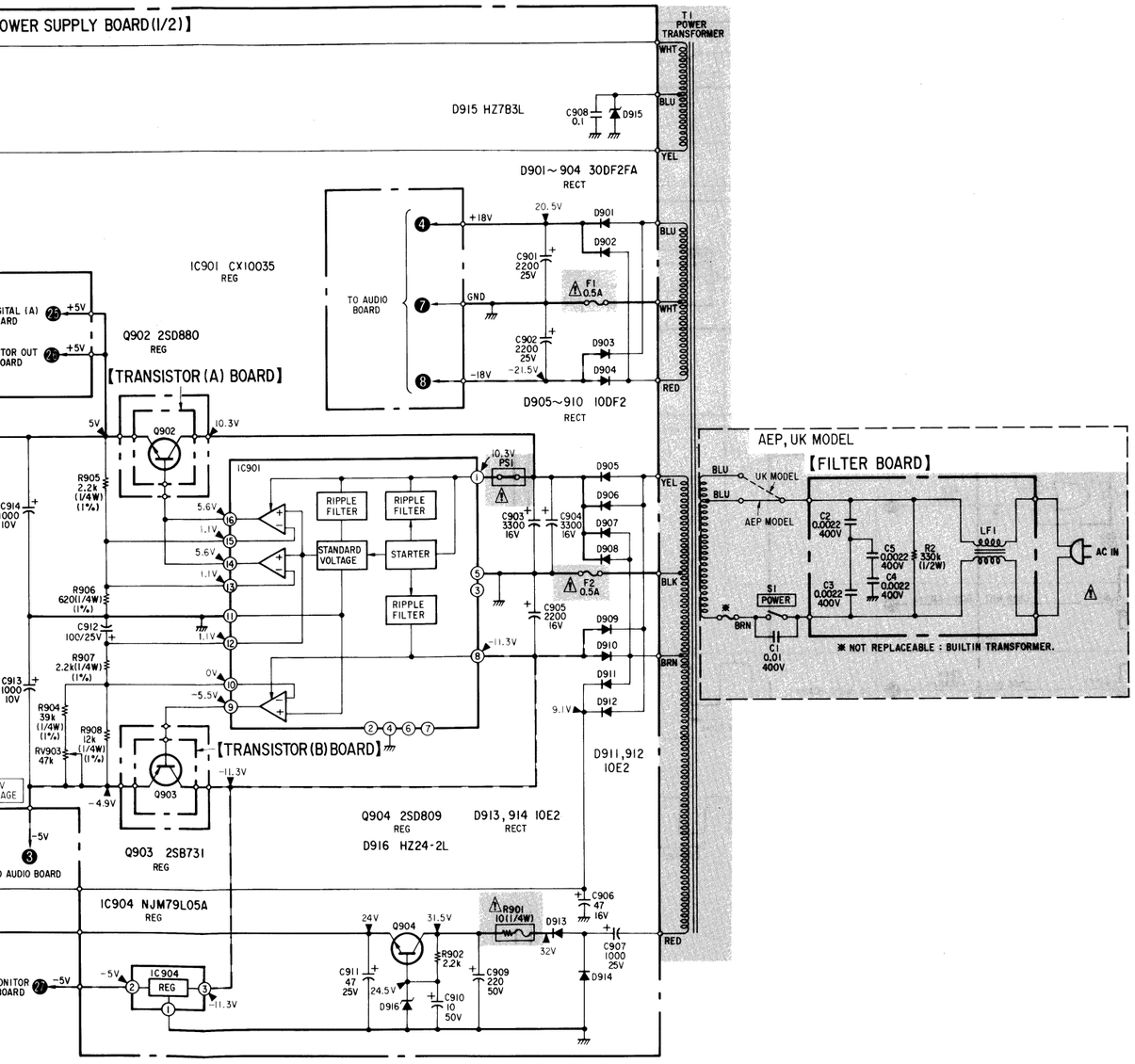
Ref. No.	Switch	Position
S2	REC RESOLUTION	14 bit

Note: Voltages are measured with a VOM (50kΩ/V).

4-4. SCHEMATIC DIAGRAM — *Power Supply Section* —

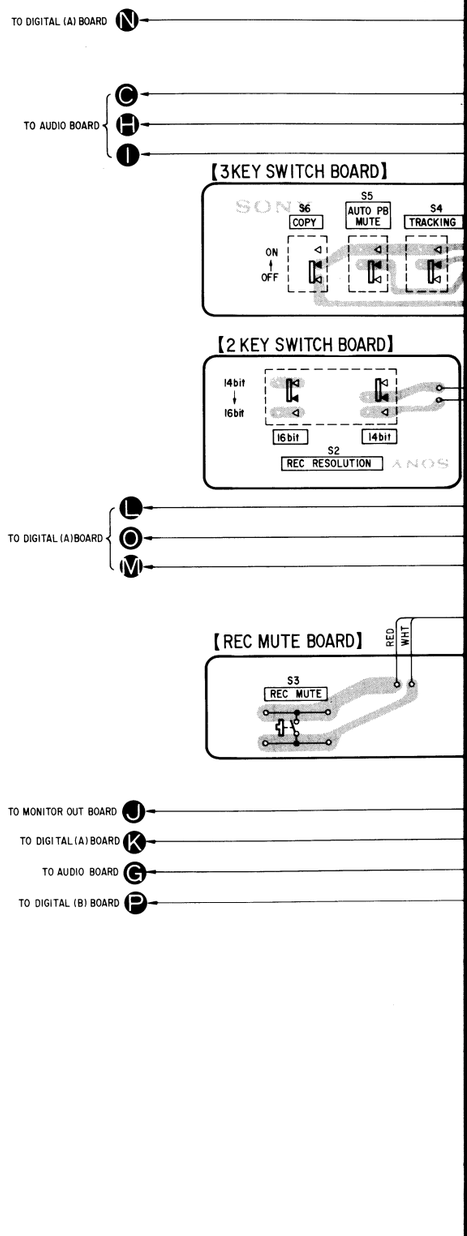






4-5. MOUNTING DIAGRAM

– Power Supply Section –



Note:

- All capacitors are in μF unless otherwise noted. pF: μμF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- ⏦ : fusible resistor.
- ▬ : B+ bus.
- ▬ ▬ : B- bus.
- ▭ : adjustment for repair.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under no-signal conditions with a VOM (50 kΩ/V).
- Voltage variations may be noted due to normal production tolerances.
- Switches

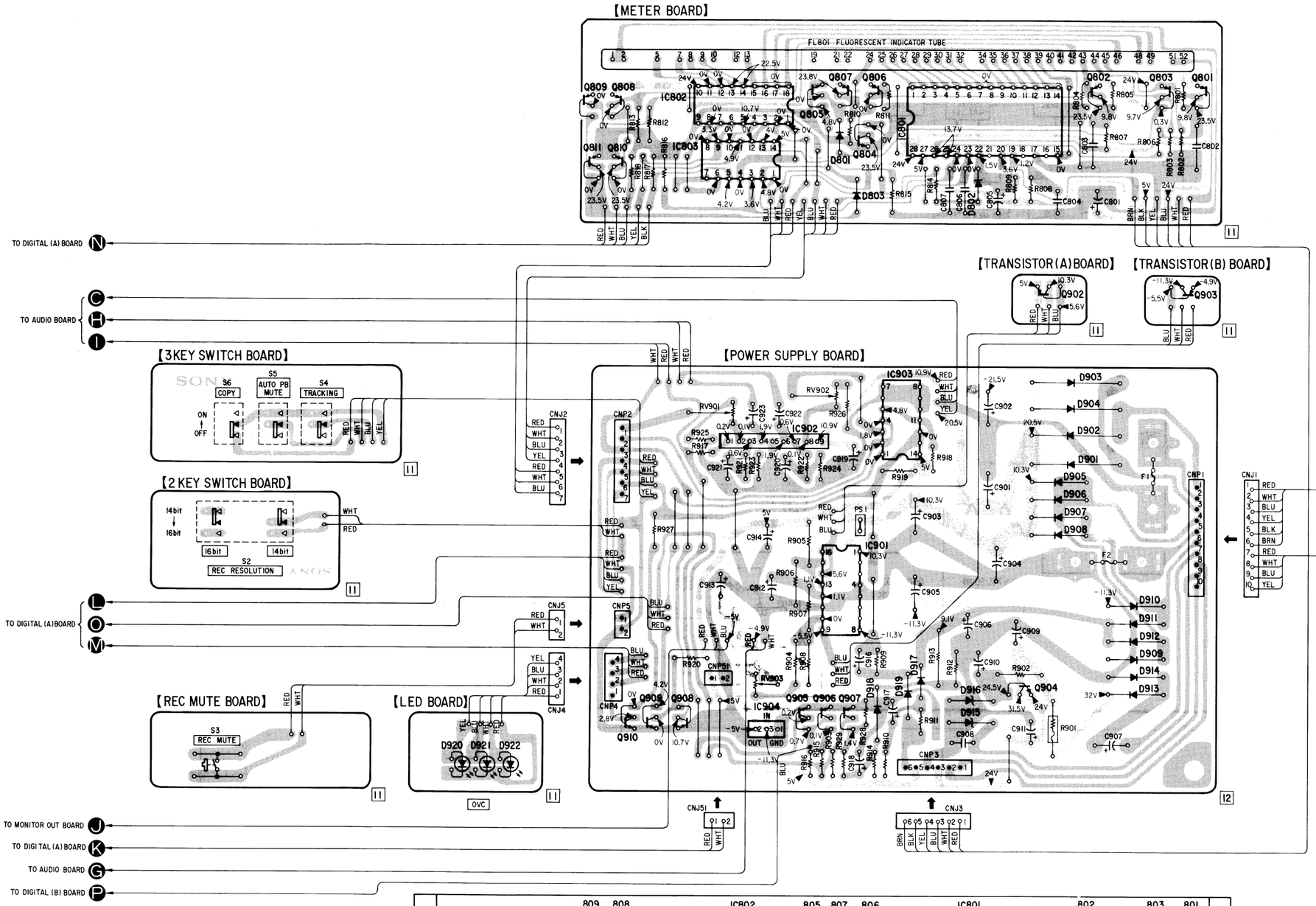
Ref. No.	Switch	Position
S1	POWER	OFF
S3	REC MUTE	OFF
S4	TRACKING	OFF
S5	AUTO PB MUTE	OFF
S6	COPY	OFF

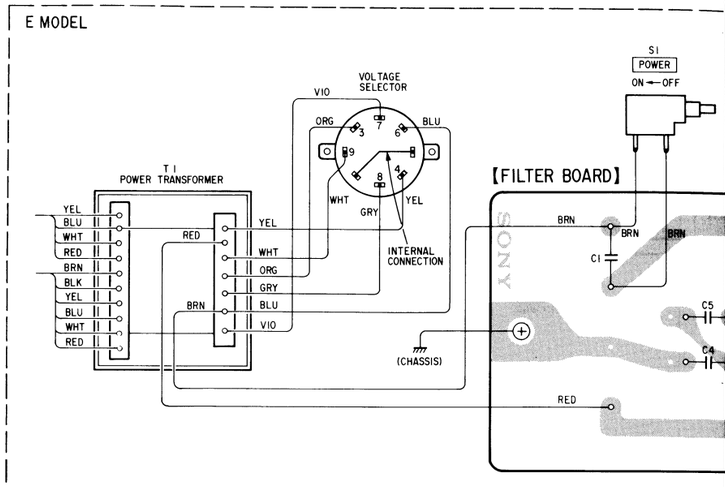
Note: Voltages are measured with a VOM (50kΩ/V).

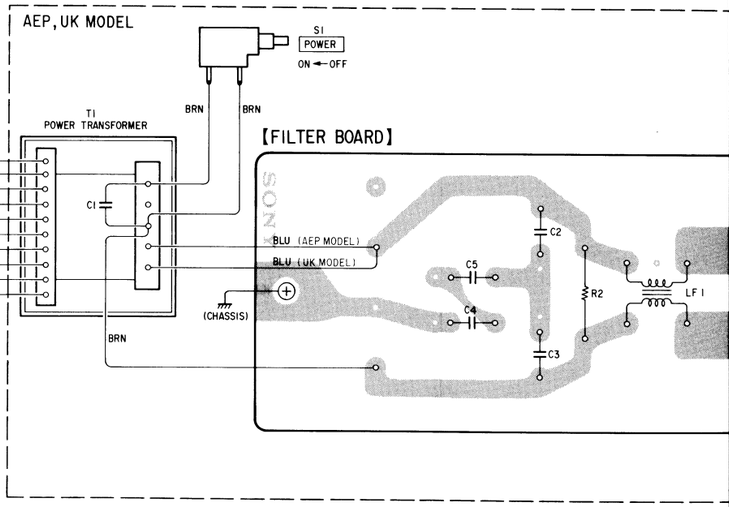
Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

4-5. MOUNTING DIAGRAM

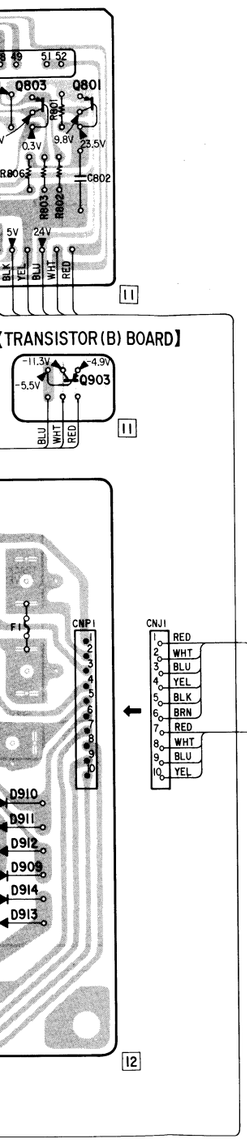
– Power Supply Section –

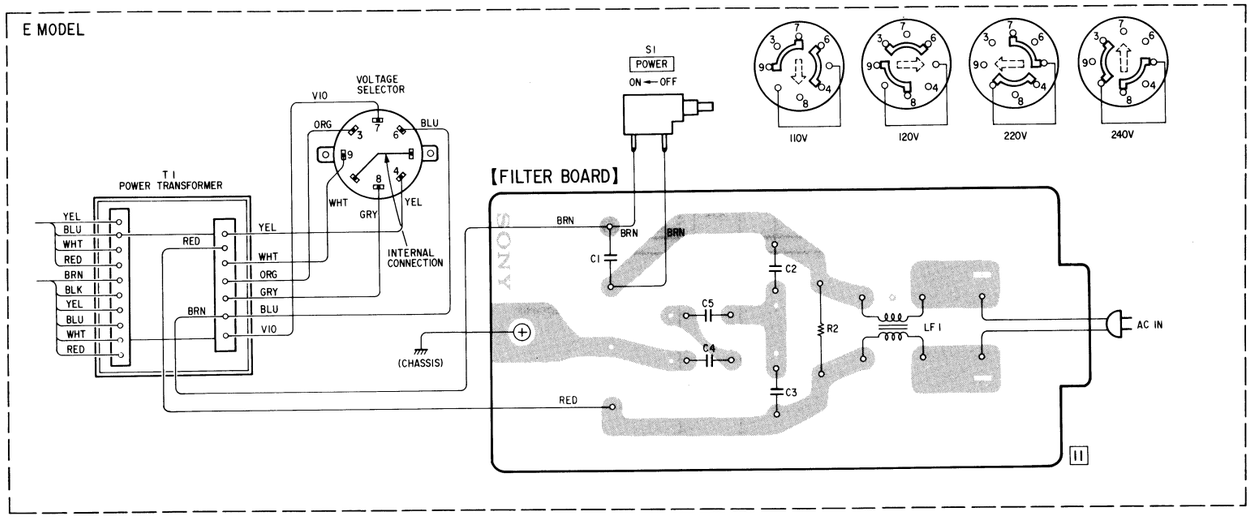


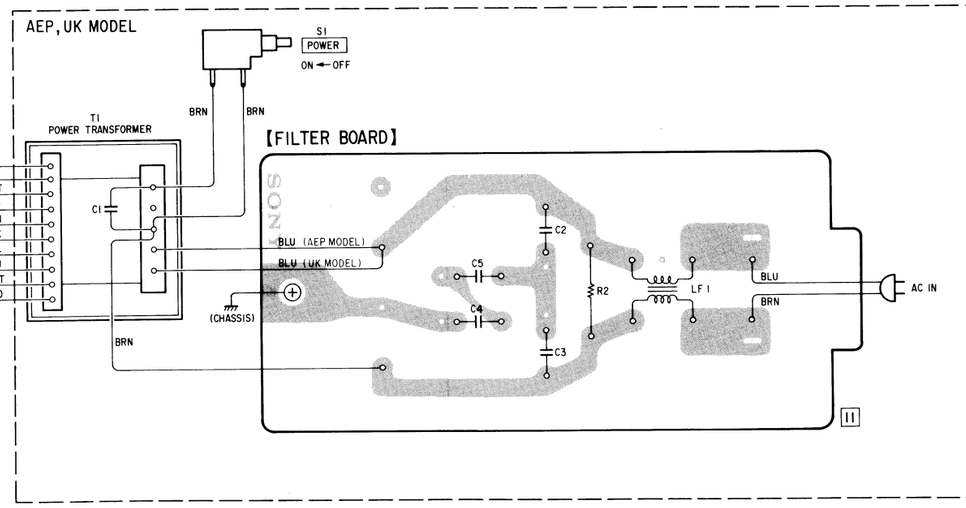




IC・Q	809 808 811 810 IC802 IC803 IC902 805 807 804 806 IC903 IC801 902 802 803 801 903 IC901 910 909 908 IC904 905 906 907 904	IC・Q
D	801 803 802 903 904 902 901 905 906 907 908 910 911 912 909 914 913 920 921 922 918 919 917 916 915	D







	803	801	
		903	IC · Q
			D
10	911		
12	909		
14	913		

Note:

- ○— : parts extracted from the component side.
- ▒▒ : B+ pattern

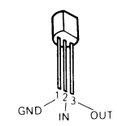
A B C D E F G H I J K

• Semiconductor Lead Layouts

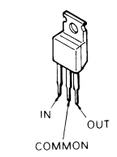
CX7914
CX7975
CX10035
CX20017
CX20018
CX23017
LB1290
MB8416A-12P-SK
MSL9359RS
NE5532P
SN7406N
SN74ALS02N
SN74LS02N
SN74LS74AN
SN74LS624N
TC4066BP
TC4069UBP
TC40H157P
TC74HC86P
TDB0353DP
TL082CP
TM4505P
μPC319C
μPD4053BC
μPD785C
μPD4584BC

BA6138
M5218L

NJM79L05A



NJM78M05A

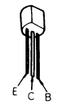


10E2
10DF2
30DF2
1SS119
1SS202-1
HZ6A-1
HZ6B2L
HZ6C3L
HZ7B3L
HZ24-2L

SEL1112R
SEL1312G

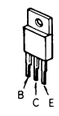
2SK152

2SA733-P



2SC2603-F
2SC2724
DTA114ES
DTC144ES

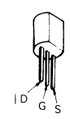
2SD880



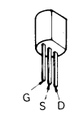
2SA1138
2SC2676

2SB548
2SB731
2SD414
2SD809

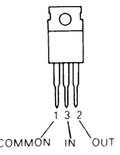
2SK121-2



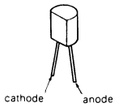
2SK120-2



NJM79M05A

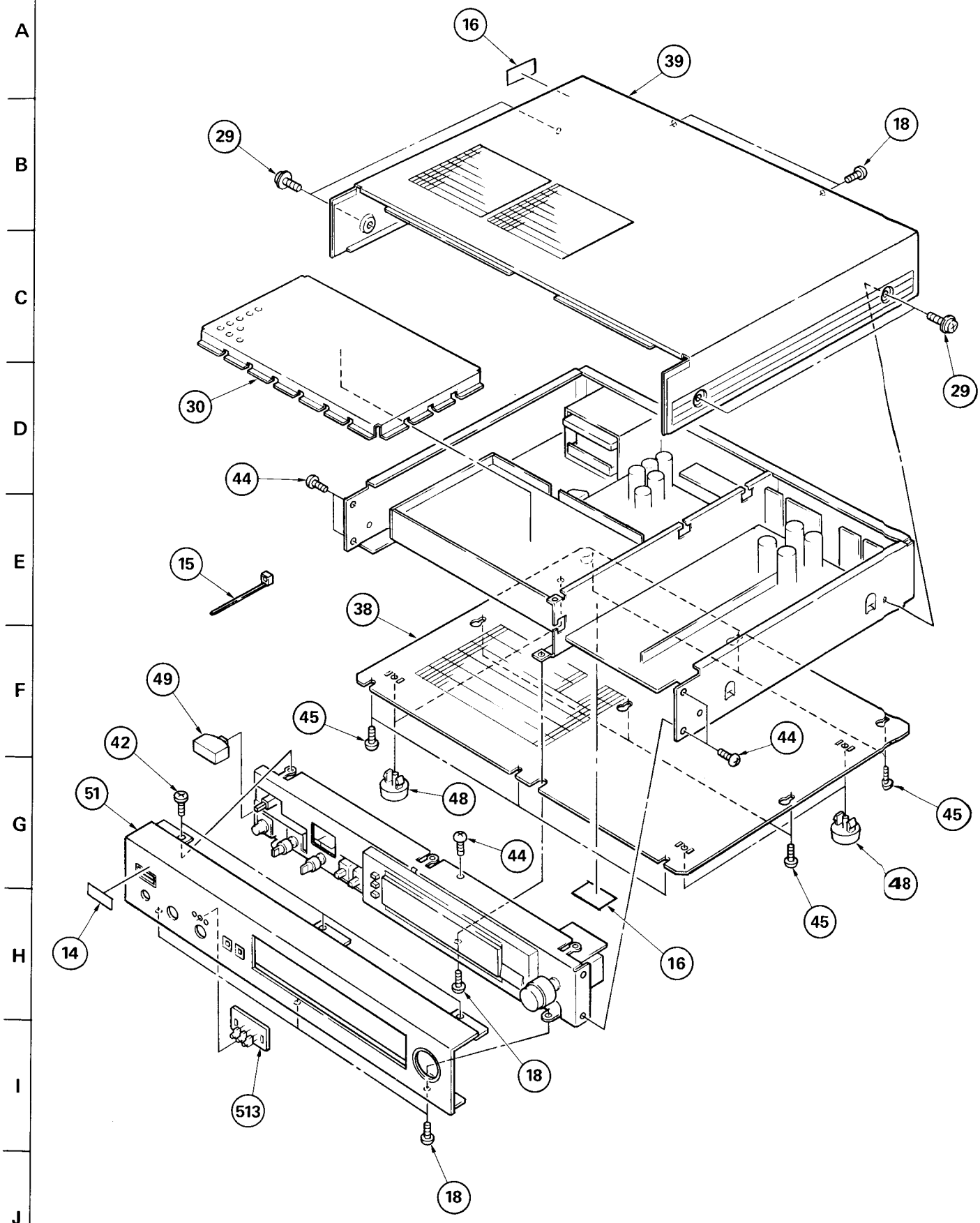


FC54M

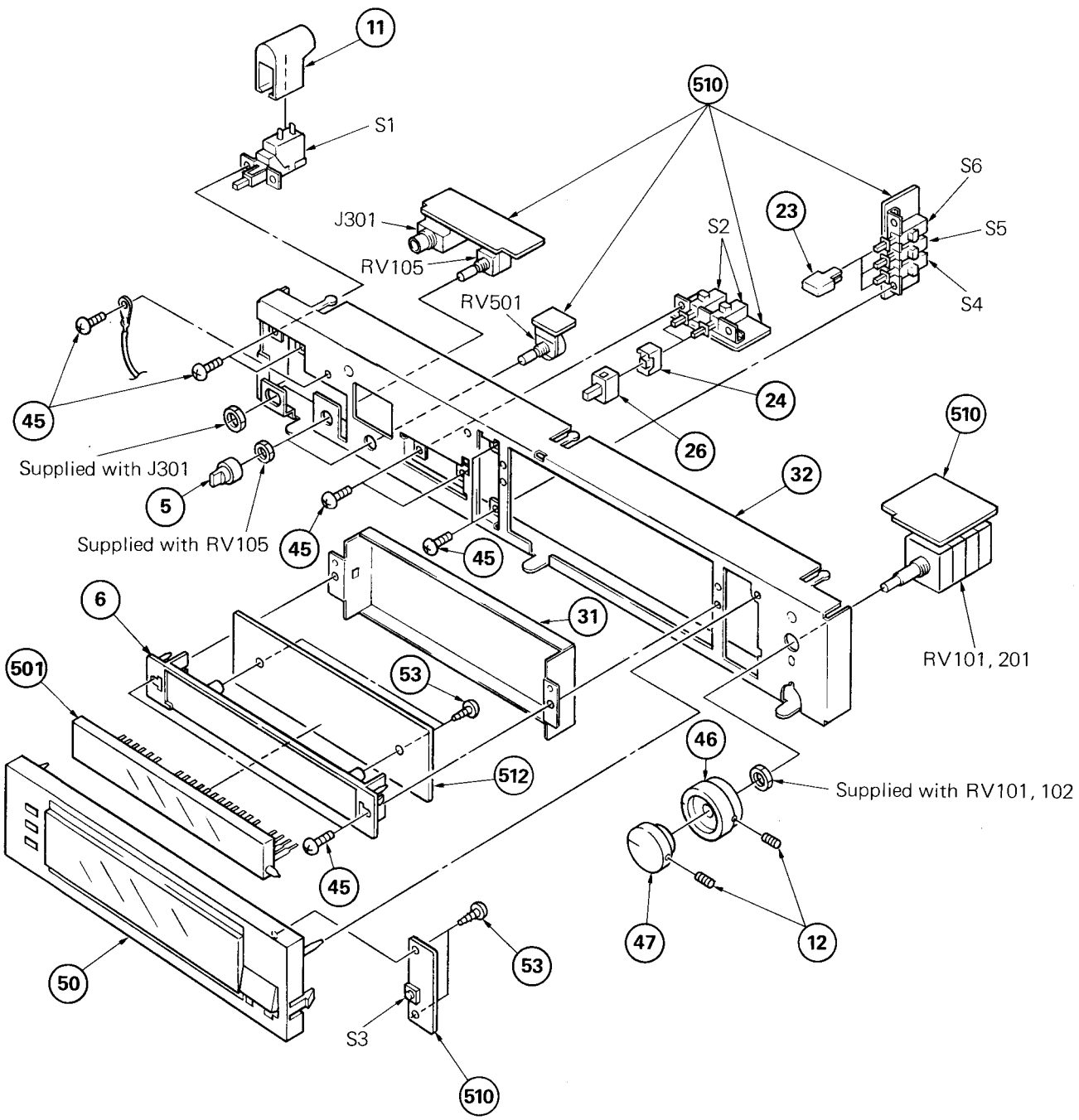


SECTION 5
EXPLODED VIEWS AND PARTS LIST

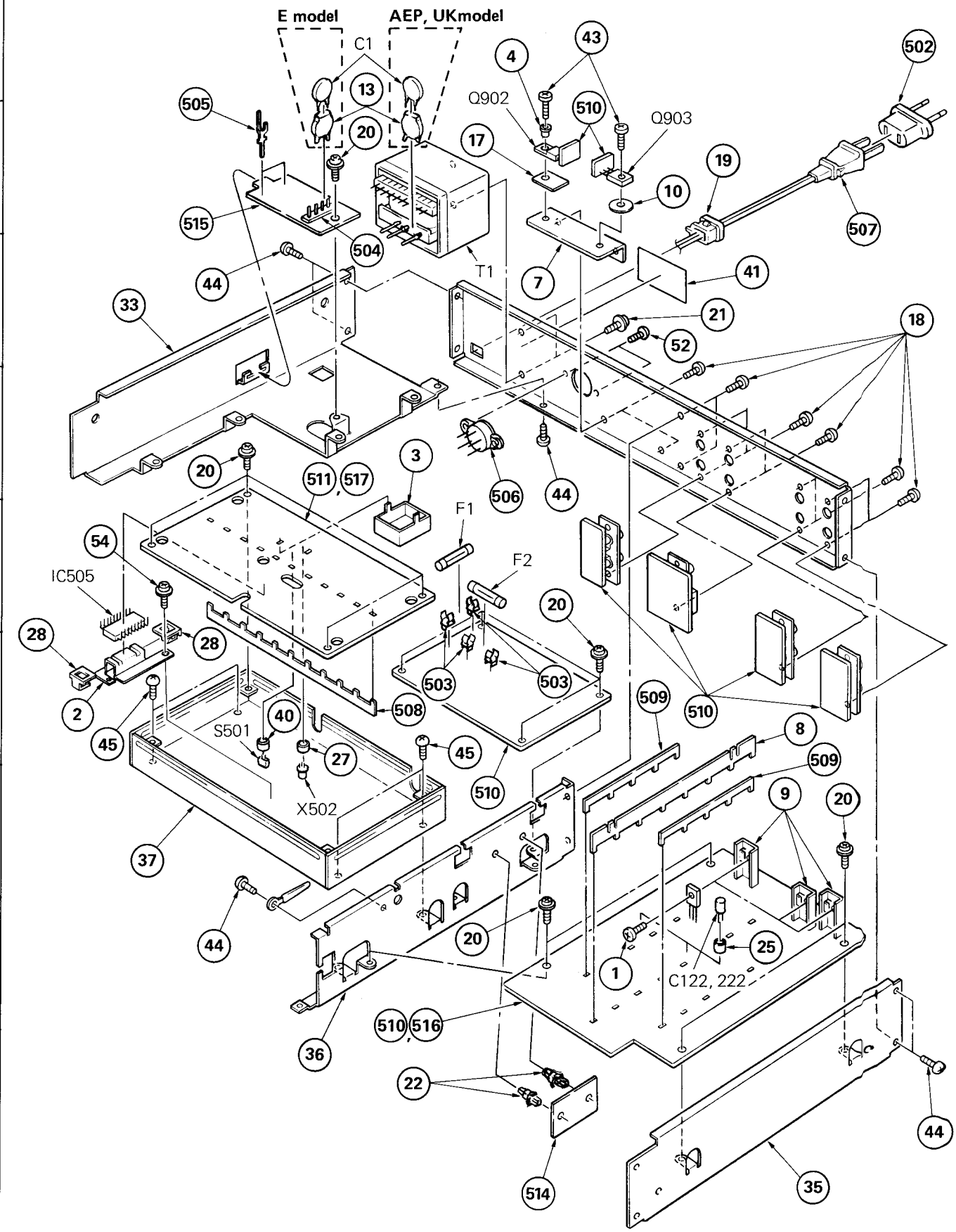
5-1.



5-2.


11
S1
510
S6
S5
S4
J301
RV105
S2
23
RV501
24
26
45
Supplied with J301
5
Supplied with RV105
45
45
32
510
RV101, 201
6
31
501
53
512
45
46
Supplied with RV101, 102
47
12
50
53
S3
510

5-3.


E model
AEP, UKmodel
C1
Q902
Q903
T1
F1
F2
IC505
S501
X502
C122, 222

GENERAL SECTION

No.	Part No.	Description
1	2-259-121-00	SCREW, TR
2	4-906-029-01	HEAT SINK, IC
3	*2-362-376-00	CASE (2), SHIELD, VCO
4	2-371-561-00	BUSHING (P), INSULATING
5	3-304-929-11	KNOB, HEADPHONE
6	*3-304-938-00	HOLDER, FL TUBE
7	*3-311-545-00	HEAT SINK
8	*3-311-617-01	REINFORCEMENT, PCB
9	*3-312-615-11	HEAT SINK
10	3-572-365-11	SHEET, INSULATING (A)
11	3-575-524-00	COVER, POWER SWITCH
12	3-701-506-01	SET SCREW, DOUBLE POINT 3X4
13	4-875-455-01	COVER, CAPACTOR
14	*3-701-690-01	(UK)...LABEL (MADE IN JAPAN)
15	3-701-748-00	CLAMP
16	*3-703-079-21	(E)....LABEL, CAUTION (BACK)
17	3-703-037-00	INSULATOR, TO-220
18	3-703-108-21	SCREW +BV 3X6, S TIGHT
19	3-703-244-00	BUSHING, CORD
20	3-703-249-01	SCREW, S TIGHT, +PTTWH 3X6
21	3-703-249-11	SCREW, S TIGHT, +PTTWH 3X6
22	*3-703-353-01	SUPPORT, PC BOARD
23	4-845-120-21	KNOB, PUSH
24	4-864-307-00	RING
25	*4-886-504-00	SPACER
26	4-886-509-00	KNOB, PUSH
27	4-886-543-00	TUBE, CUSHION
28	4-886-557-00	CLIP (B), IC
29	4-889-321-31	SCREW
30	*4-906-003-01	COVER, DIGITAL SHIELD
31	*4-906-006-01	CASE, SHIELD, METER
32	*4-906-007-01	CHASSIS, AMPLIFIER
33	*4-906-008-01	PLATE, SIED, LEFT
34	4-906-009-01	(AEP,UK)....PLATE, JACK
34	4-906-009-11	(E).....PLATE, JACK
35	*4-906-011-01	PLATE, SIDE, RIGHT
36	*4-906-012-01	PLATE, RELAY
37	*4-906-013-01	CASE, SHIELD, DIGITAL
38	*4-906-015-01	PLATE, BOTTOM
39	4-906-016-01	CASE
40	*4-906-025-01	RUBBER, SPACER
41	*4-906-026-01	(G-AEP)...LABEL, MODEL NUMBER(AE1)
41	*4-906-026-11	(AEP).....LABEL, MODEL NUMBER(AE4)
41	*4-906-027-01	(UK).....LABEL, MODEL NUMBER(UK)
41	*4-906-028-01	(E).....LABEL, MODEL NUMBER(E2/E3)

GENERAL SECTION

No.	Part No.	Description
42	7-682-547-09	SCREW +B 3X6
43	7-682-548-09	SCREW +B 3X8
44	7-685-872-09	SCREW +BVTT 3X8 (S)
45	7-685-871-01	SCREW +BVTT 3X6 (S)
46	X-3304-909-0	KNOB (RIGHT) ASSY, REC
47	X-3304-910-0	KNOB (LEFT) ASSY, REC
48	X-4864-303-0	FOOT ASSY
49	X-4881-408-0	KNOB ASSY, POWER
50	X-4906-002-1	ESCUTCHEON ASSY
51	X-4906-003-1	(NTSC).....FRONT PANEL ASSY
51	X-4906-004-1	(PAL/SECAM)...FRONT PANEL ASSY
52	7-621-775-20	(E)....SCREW +B 2.6X5
53	7-685-545-14	SCREW +BTP 3X6
54	7-687-204-11	SCREW +PTPWH 2X6

ACCESSORY & PACKING MATERIAL

No.	Part No.	Description
101	1-551-734-11	CORD, CONNECTION (RK- 74A)
102	1-556-464-00	CORD, CONNECTION
103	3-536-825-00	BAG, PROTECTING
104	3-701-630-00	BAG, POLYETHYLENE
105	3-703-710-41	STICKER, SONY SYMBOL (12)
106	3-773-581-11	MANUAL, INSTRUCTION
107	4-906-019-01	CUSHION (LEFT), LOWER
108	4-906-020-01	CUSHION (RIGHT), LOWER
109	4-906-021-01	CUSHION (LEFT), UPPER
110	4-906-022-01	CUSHION (RIGHT), UPPER

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " ★ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:

- All capacitors are in μF. Common capacitors are omitted. Refer to the following lists for their part numbers. MF:μF, PF:μμF.

COILS

- MMH : mH, UH : μH

SEMICONDUCTORS

In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···,
UPC···: μPC,
UPD···: μPD···

ELECTRICAL PARTS

Ref.No.	Part No.	Description
501	1-519-320-11	INDICATOR TUBE, FLUORESCENT
502	⚠1-526-565-00	(E)...AC PLUG ADAPTOR
503	1-533-131-00	HOLDER, FUSE
504	*1-535-141-00	BASE POST 19MM (10MM PITCH) 4P
505	1-535-416-00	TERMINAL
506	⚠1-552-963-11	(E)...SWITCH, POWER VOLTAGE SELECT
507	⚠1-555-795-00	(AEP)...CORD, POWER
507	⚠1-556-035-00	(UK)....CORD, POWER
507	⚠1-556-091-00	(E).....CORD, POWER
508	*1-560-242-41	BUS BAR 11P
509	*1-560-242-71	BUS BAR 6P
510	*1-612-713-11	PC BOARD, AUDIO
511	*1-612-714-11	PC BOARD, DIGITAL
512	*1-612-715-11	PC BOARD, METER
513	*1-612-765-11	PC BOARD, LED
514	*1-613-177-12	PC BOARD, DIGITAL (B)
515	*1-613-471-11	PC BOARD, FILTER
516	*A-4335-339-A	MOUNTED PCB, AUDIO
517	*A-4335-314-A	(NTSC).....MOUNTED PCB, DIGITAL
517	*A-4335-340-A	(PAL/SECAM)...MOUNTED PCB, DIGITAL
C1	⚠1-161-744-00	CAP, CERAMIC 10000PF FZ
C2	⚠1-161-734-00	CERAMIC 0.0022MF 20% 400V
C3	⚠1-161-734-00	CERAMIC 0.0022MF 20% 400V
C4	⚠1-161-734-00	CERAMIC 0.0022MF 20% 400V
C5	⚠1-161-734-00	CERAMIC 0.0022MF 20% 400V
C101	1-107-165-00	MICA 56PF 5% 500V
C102	1-130-205-00	FILM 0.056MF 2% 630V
C103	1-107-310-00	MICA 220PF 5% 500V
C104	1-124-334-00	ELECT 4.7MF 20% 100V
C109	1-123-371-00	ELECT 22MF 20% 63V
C110	1-104-255-11	POLYSTYRENE 0.0018MF 5% 125V
C111	1-162-037-00	CERAMIC 100PF 5% 50V
C112	1-162-037-00	CERAMIC 100PF 5% 50V
C113	1-123-370-00	ELECT 10MF 20% 63V
C121	1-162-021-00	CERAMIC 22PF 5% 50V
C122	1-104-230-00	POLYSTYRENE 0.0015MF 5% 50V
C123	1-123-371-00	ELECT 22MF 20% 63V
C124	1-104-233-00	POLYSTYRENE 220PF 5% 125V
C127	1-104-240-00	POLYSTYRENE 0.001MF 5% 125V
C128	1-104-240-00	POLYSTYRENE 0.001MF 5% 125V
C129	1-130-163-00	FILM 0.0039MF 2% 630V
C130	1-124-334-00	ELECT 4.7MF 20% 100V
C131	1-107-310-00	MICA 220PF 5% 500V
C301	1-123-371-00	ELECT 22MF 20% 63V
C302	1-123-371-00	ELECT 22MF 20% 63V
C303	1-123-371-00	ELECT 22MF 20% 63V

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
C304	1-123-371-00	ELECT	22MF	20%	63V
C305	1-123-371-00	ELECT	22MF	20%	63V
C306	1-123-371-00	ELECT	22MF	20%	63V
C307	1-123-324-00	ELECT	1000MF	20%	16V
C308	1-123-333-00	ELECT	100MF	20%	16V
C309	1-123-390-00	ELECT	330MF	20%	63V
C310	1-123-390-00	ELECT	330MF	20%	63V
C311	1-123-371-00	ELECT	22MF	20%	63V
C312	1-123-371-00	ELECT	22MF	20%	63V
C313	1-123-338-00	ELECT	2200MF	20%	25V
C314	1-123-338-00	ELECT	2200MF	20%	25V
C315	1-162-110-00	CERAMIC	0.001MF	10%	50V
C316	1-131-520-00	TANTALUM	22MF	20%	16V
C317	1-131-371-00	TANTALUM	10MF	20%	16V
C318	1-161-494-00	CERAMIC	0.022MF	30%	25V
C319	1-162-110-00	CERAMIC	0.001MF	10%	50V
C320	1-162-040-00	CERAMIC	4.7PF	10%	50V
C321	1-162-046-00	CERAMIC	12PF	5%	50V
C322	1-123-384-00	ELECT	10MF	20%	50V
C323	1-123-380-00	ELECT	1MF	20%	50V
C324	1-123-371-00	ELECT	22MF	20%	63V
C325	1-162-021-00	CERAMIC	22PF	5%	50V
C326	1-162-110-00	CERAMIC	0.001MF	10%	50V
C327	1-123-306-00	ELECT	47MF	20%	10V
C328	1-123-298-00	ELECT	470MF	20%	6.3V
C329	1-123-298-00	ELECT	470MF	20%	6.3V
C330	1-161-494-00	CERAMIC	0.022MF	30%	25V
C331	1-161-494-00	CERAMIC	0.022MF	30%	25V
C332	1-123-384-00	ELECT	10MF	20%	50V
C333	1-123-384-00	ELECT	10MF	20%	50V
C334	1-162-029-00	CERAMIC	47PF	5%	50V
C335	1-162-050-00	CERAMIC	18PF	5%	50V
C336	1-162-029-00	CERAMIC	47PF	5%	50V
C337	1-162-110-00	CERAMIC	0.001MF	10%	50V
C338	1-131-520-00	TANTALUM	22MF	20%	16V
C339	1-161-494-00	CERAMIC	0.022MF	30%	25V
C340	1-123-384-00	ELECT	10MF	20%	50V
C341	1-123-371-00	ELECT	22MF	20%	63V
C342	1-123-371-00	ELECT	22MF	20%	63V
C343	1-123-371-00	ELECT	22MF	20%	63V
C345	1-123-371-00	ELECT	22MF	20%	63V
C346	1-123-371-00	ELECT	22MF	20%	63V
C347	1-123-371-00	ELECT	22MF	20%	63V
C348	1-123-371-00	ELECT	22MF	20%	63V
C349	1-123-333-00	ELECT	100MF	20%	16V
C350	1-123-333-00	ELECT	100MF	20%	16V

NOTE:

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- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:

- All capacitors are in μF. Common capacitors are omitted. Refer to the following lists for their part numbers. MF:μF, PF:μμF.

COILS

- MMH : mH, UH : μH

SEMICONDUCTORS

In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC, UPD···: μPD···

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
C351	1-161-494-00	CERAMIC	0.022MF	30%	25V
C352	1-162-110-00	CERAMIC	0.001MF	10%	50V
C353	1-162-110-00	CERAMIC	0.001MF	10%	50V
C354	1-162-037-00	CERAMIC	100PF	5%	50V
C355	1-162-102-00	CERAMIC	220PF	10%	50V
C356	1-123-321-00	ELECT	220MF	20%	16V
C357	1-123-321-00	ELECT	220MF	20%	16V
C358	1-107-311-00	MICA	15PF	5%	500V
C359	1-107-311-00	MICA	15PF	5%	500V
C360	1-123-306-00	ELECT	47MF	20%	10V
C361	1-123-306-00	ELECT	47MF	20%	10V
C502	1-123-330-00	ELECT	22MF	20%	25V
C503	1-123-307-00	ELECT	100MF	20%	6.3V
C504	1-123-228-00	ELECT	1MF	20%	50V
C505	1-123-380-00	ELECT	1MF	20%	50V
C506	1-123-380-00	ELECT	1MF	20%	50V
C507	1-123-228-00	ELECT	1MF	20%	50V
C508	1-123-380-00	ELECT	1MF	20%	50V
C509	1-123-447-00	ELECT	0.22MF	20%	50V
C510	1-123-307-00	ELECT	100MF	20%	6.3V
C511	1-123-228-00	ELECT	1MF	20%	50V
C512	1-123-380-00	ELECT	1MF	20%	50V
C513	1-162-284-31	CERAMIC	150PF	10%	50V
C514	1-162-306-31	CERAMIC	0.01MF	20%	16V
C515	1-162-284-31	CERAMIC	150PF	10%	50V
C516	1-123-369-00	ELECT	4.7MF	20%	50V
C517	1-123-369-00	ELECT	4.7MF	20%	50V
C518	1-161-494-00	CERAMIC	0.022MF	30%	25V
C519	1-161-494-00	CERAMIC	0.022MF	30%	25V
C520	1-161-494-00	CERAMIC	0.022MF	30%	25V
C521	1-161-494-00	CERAMIC	0.022MF	30%	25V
C522	1-123-380-00	ELECT	1MF	20%	50V
C523	1-123-356-00	ELECT	10MF	20%	50V
C524	1-123-380-00	ELECT	1MF	20%	50V
C525	1-123-381-00	ELECT	2.2MF	20%	50V
C526	1-123-369-00	ELECT	4.7MF	20%	50V
C527	1-123-356-00	ELECT	10MF	20%	50V
C529	1-162-282-31	CERAMIC	100PF	10%	50V
C530	1-162-203-31	CERAMIC	15PF	5%	50V
C531	1-162-306-31	CERAMIC	0.01MF	20%	16V
C532	1-162-282-31	CERAMIC	100PF	10%	50V
C533	1-161-494-00	CERAMIC	0.022MF	30%	25V
C534	1-161-494-00	CERAMIC	0.022MF	30%	25V
C535	1-161-494-00	CERAMIC	0.022MF	30%	25V
C536	1-161-494-00	CERAMIC	0.022MF	30%	25V
C537	1-161-494-00	CERAMIC	0.022MF	30%	25V

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
C538	1-162-282-31	CERAMIC	100PF	10%	50V
C539	1-161-494-00	CERAMIC	0.022MF	30%	25V
C540	1-161-494-00	CERAMIC	0.022MF	30%	25V
C541	1-161-494-00	CERAMIC	0.022MF	30%	25V
C542	1-161-494-00	CERAMIC	0.022MF	30%	25V
C543	1-161-494-00	CERAMIC	0.022MF	30%	25V
C544	1-161-494-00	CERAMIC	0.022MF	30%	25V
C545	1-161-494-00	CERAMIC	0.022MF	30%	25V
C546	1-161-494-00	CERAMIC	0.022MF	30%	25V
C547	1-161-494-00	CERAMIC	0.022MF	30%	25V
C548	1-123-298-00	ELECT	470MF	20%	6.3V
C549	1-123-298-00	ELECT	470MF	20%	6.3V
C550	1-161-494-00	CERAMIC	0.022MF	30%	25V
C552	1-123-298-00	ELECT	470MF	20%	6.3V
C553	1-161-494-00	CERAMIC	0.022MF	30%	25V
C554	1-123-321-00	ELECT	220MF	20%	16V
C555	1-161-494-00	CERAMIC	0.022MF	30%	25V
C556	1-123-321-00	ELECT	220MF	20%	16V
C557	1-161-494-00	CERAMIC	0.022MF	30%	25V
C558	1-161-494-00	CERAMIC	0.022MF	30%	25V
C559	1-162-199-31	CERAMIC	10PF	5%	50V
C560	1-162-199-31	CERAMIC	10PF	5%	50V
C561	1-162-284-31	CERAMIC	150PF	10%	50V
C562	1-162-207-31	CERAMIC	22PF	5%	50V
C563	1-162-196-31	CERAMIC	5.6PF	10%	50V
C564	1-123-298-00	ELECT	470MF	20%	6.3V
C565	1-123-298-00	ELECT	470MF	20%	6.3V
C566	1-162-211-31	CERAMIC	33PF	5%	50V
C567	1-123-356-00	ELECT	10MF	20%	50V
C568	1-162-306-31	CERAMIC	0.01MF	20%	16V
C569	1-162-287-31	CERAMIC	270PF	10%	50V
C570	1-162-196-31	CERAMIC	5.6PF	10%	50V
C571	1-161-494-00	CERAMIC	0.022MF	30%	25V
C572	1-161-494-00	CERAMIC	0.022MF	30%	25V
C573	1-162-304-31	CERAMIC	0.0047MF	20%	16V
C574	1-162-199-31	CERAMIC	10PF	5%	50V
C575	1-162-203-31	CERAMIC	15PF	5%	50V
C576	1-162-203-31	CERAMIC	15PF	5%	50V
C577	1-162-203-31	CERAMIC	15PF	5%	50V
C650	1-123-369-00	ELECT	4.7MF	20%	50V
C651	1-123-369-00	ELECT	4.7MF	20%	50V
C652	1-123-380-00	ELECT	1MF	20%	50V
C653	1-161-494-00	CERAMIC	0.022MF	30%	25V
C701	1-162-106-00	(PAL/SECAM)..CERAMIC	470PF	10%	50V
C702	1-162-286-31	(PAL/SECAM)..CERAMIC	220PF	10%	50V
C703	1-162-306-31	(PAL/SECAM)..CERAMIC	0.01MF	20%	16V

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " ★ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:

- All capacitors are in μF. Common capacitors are omitted. Refer to the following lists for their part numbers. MF:μF, PF:μμF.

COILS

- MMH : mH, UH : μH

SEMICONDUCTORS

In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···,
UPC···: μPC,
UPD···: μPD···

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
C704	1-162-306-31	(PAL/SECAM)..CERAMIC	0.01MF	20%	16V
C705	1-162-203-31	(PAL/SECAM)..CERAMIC	15PF	5%	50V
C706	1-161-494-00	(PAL/SECAM)..CERAMIC	0.022MF	30%	25V
C801	1-123-356-00	ELECT	10MF	20%	50V
C802	1-161-330-00	CERAMIC	0.01MF	30%	25V
C803	1-161-330-00	CERAMIC	0.01MF	30%	25V
C804	1-136-156-00	FILM	0.018MF	5%	50V
C805	1-123-382-00	ELECT	3.3MF	20%	50V
C806	1-162-108-00	CERAMIC	680PF	10%	50V
C807	1-162-108-00	CERAMIC	680PF	10%	50V
C901	1-123-338-00	ELECT	2200MF	20%	25V
C902	1-123-338-00	ELECT	2200MF	20%	25V
C903	1-123-326-00	ELECT	3300MF	20%	16V
C904	1-123-326-00	ELECT	3300MF	20%	16V
C905	1-123-325-00	ELECT	2200MF	20%	16V
C906	1-123-332-00	ELECT	47MF	20%	16V
C907	1-123-337-00	ELECT	1000MF	20%	25V
C908	1-136-165-00	FILM	0.1MF	5%	50V
C909	1-123-361-00	ELECT	220MF	20%	50V
C910	1-123-356-00	ELECT	10MF	20%	50V
C911	1-123-332-00	ELECT	47MF	20%	25V
C912	1-123-333-00	ELECT	100MF	20%	25V
C913	1-123-311-00	ELECT	1000MF	20%	10V
C914	1-123-311-00	ELECT	1000MF	20%	10V
C916	1-123-380-00	ELECT	1MF	20%	50V
C917	1-123-356-00	ELECT	10MF	20%	25V
C918	1-123-306-00	ELECT	47MF	20%	10V
C919	1-123-321-00	ELECT	220MF	20%	16V
C920	1-123-380-00	ELECT	1MF	20%	50V
C921	1-123-380-00	ELECT	1MF	20%	50V
C922	1-123-356-00	ELECT	10MF	20%	25V
C923	1-123-356-00	ELECT	10MF	20%	25V
CNJ101	1-507-898-11	JACK, PIN 2P (LINE IN L-CH)			
CNJ102	1-507-898-11	JACK, PIN 2P (LINE OUT L-CH)			
CNJ201	1-507-898-11	JACK, PIN 2P (LINE IN R-CH)			
CNJ202	1-507-898-11	JACK, PIN 2P (LINE OUT R-CH)			
CNJ301	1-507-898-21	JACK, PIN 2P (VIDEO IN)			
CNJ302	1-507-898-21	JACK, PIN 2P (MONITOR OUT)			
CNJ303	1-507-898-21	JACK, PIN 2P (VIDEO OUT)			
CNJ304	1-507-898-21	JACK, PIN 2P (COPY OUT)			
CNP1	*1-560-066-00	PIN, CONNECTOR 10P			
CNP2	*1-560-338-00	PIN, CONNECTOR 7P			
CNP3	*1-560-064-00	PIN, CONNECTOR 6P			
CNP4	*1-560-062-00	PIN, CONNECTOR 4P			
CNP5	*1-560-060-00	PIN, CONNECTOR 2P			
CNP51	*1-560-060-00	PIN, CONNECTOR 2P			

ELECTRICAL PARTS

Ref.No.	Part No.	Description
CNP52	*1-560-060-00	PIN, CONNECTOR 2P
CNP53	*1-560-060-00	PIN, CONNECTOR 2P
CNP54	*1-560-061-00	PIN, CONNECTOR 3P
CNP55	*1-560-062-00	PIN, CONNECTOR 4P
CNP56	*1-560-060-00	PIN, CONNECTOR 2P
CNP501	*1-560-060-00	PIN, CONNECTOR 2P
CNP502	*1-560-062-00	PIN, CONNECTOR 4P
CNP503	*1-560-061-00	PIN, CONNECTOR 3P
CNP504	*1-560-062-00	PIN, CONNECTOR 4P
CNP505	*1-560-061-00	PIN, CONNECTOR 3P
CNP506	*1-560-063-00	PIN, CONNECTOR 5P
CNP507	*1-560-061-00	PIN, CONNECTOR 3P
CNP650	*1-560-064-00	PIN, CONNECTOR 6P
CNP651	*1-560-061-00	PIN, CONNECTOR 3P
CNP652	*1-560-062-00	PIN, CONNECTOR 4P
D101	8-719-910-65	DIODE HZ6B2L
D102	8-719-911-19	DIODE 1SS119
D103	8-719-910-65	DIODE HZ6B2L
D201	8-719-910-65	DIODE HZ6B2L
D202	8-719-911-19	DIODE 1SS119
D203	8-719-910-65	DIODE HZ6B2L
D301	8-719-911-19	DIODE 1SS119
D302	8-719-911-19	DIODE 1SS119
D303	8-719-911-19	DIODE 1SS119
D304	8-719-910-65	DIODE HZ6B2L
D305	8-719-910-65	DIODE HZ6B2L
D306	8-719-910-65	DIODE HZ6B2L
D307	8-719-910-69	DIODE HZ6C3L
D501	8-719-911-19	DIODE 1SS119
D502	8-719-911-19	DIODE 1SS119
D503	8-719-911-19	DIODE 1SS119
D504	8-719-911-19	DIODE 1SS119
D505	8-719-911-19	DIODE 1SS119
D506	8-719-992-61	DIODE HZ6A1
D507	8-719-915-43	DIODE FC54M
D510	8-719-911-19	DIODE 1SS119
D511	8-719-911-19	DIODE 1SS119
D512	8-719-911-19	DIODE 1SS119
D513	8-719-911-19	DIODE 1SS119
D650	8-719-911-19	DIODE 1SS119
D801	8-719-107-94	DIODE 1SS202-1
D802	8-719-107-94	DIODE 1SS202-1
D803	8-719-107-94	DIODE 1SS202-1
D901	8-719-230-02	DIODE 30DF2
D902	8-719-230-02	DIODE 30DF2

NOTE:

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- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:

- All capacitors are in μF. Common capacitors are omitted. Refer to the following lists for their part numbers. MF:μF, PF:μμF.

COILS

- MMH : mH, UH : μH

SEMICONDUCTORS

In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···,
UPC···: μPC,
UPD···: μPD···

ELECTRICAL PARTS

Ref.No.	Part No.	Description
D903	8-719-230-02	DIODE 30DF2
D904	8-719-230-02	DIODE 30DF2
D905	8-719-210-12	DIODE 10DF2
D906	8-719-210-12	DIODE 10DF2
D907	8-719-210-12	DIODE 10DF2
D908	8-719-210-12	DIODE 10DF2
D909	8-719-210-12	DIODE 10DF2
D910	8-719-210-12	DIODE 10DF2
D911	8-719-200-02	DIODE 10E-2
D912	8-719-200-02	DIODE 10E-2
D913	8-719-200-02	DIODE 10E-2
D914	8-719-200-02	DIODE 10E-2
D915	8-719-910-76	DIODE HZ7B3L
D916	8-719-910-42	DIODE HZ24-2L
D917	8-719-107-94	DIODE 1SS202-1
D918	8-719-107-94	DIODE 1SS202-1
D919	8-719-107-94	DIODE 1SS202-1
D920	8-719-311-12	DIODE SEL1112R(LED)
D921	8-719-313-12	DIODE SEL1312G(LED)
D922	8-719-313-12	DIODE SEL1312G(LED)
F1	⚠1-532-279-00	FUSE, TIME-LAG(500mA)
F2	⚠1-532-215-00	FUSE, TIME-LAG(800mA)
IC101	8-759-910-77	LF353N/GLEA312
IC102	8-759-910-75	IC TDB0353DP
IC103	8-759-900-72	IC NE5532P
IC104	8-759-910-75	IC TDB0353DP
IC201	8-759-910-77	LF353N/GLEA312
IC202	8-759-910-75	IC TDB0353DP
IC203	8-759-900-72	IC NE5532P
IC204	8-759-910-75	IC TDB0353DP
IC301	8-759-910-75	IC TDB0353DP
IC302	8-752-001-80	IC CX20018
IC303	8-752-001-70	IC CX20017
IC304	8-759-140-53	IC UPD4053BC
IC305	8-759-600-02	IC M5218L
IC306	8-759-700-11	IC NJM78M05A
IC307	8-759-700-20	IC NJM79M05A
IC308	8-759-600-02	IC M5218L
IC309	8-759-900-02	IC SN74LS02N
IC310	8-759-145-84	IC UPD4584BC
IC501	8-759-102-72	IC CX23017
IC502	8-759-178-50	IC UPD785C
IC503	8-759-911-92	IC MB8416A-12P-SK
IC504	8-759-974-06	IC SN7406N
IC505	8-759-103-19	IC UPC319C
IC506	8-759-979-14	IC CX-7914

ELECTRICAL PARTS

Ref.No.	Part No.	Description
IC507	8-759-102-73	IC CX-7975
IC508	8-759-245-05	IC TM4505P
IC509	8-759-911-92	IC MB8416A-12P-SK
IC510	8-759-990-82	IC TL082CP
IC511	8-759-900-67	IC SN74ALS02N
IC512	8-759-900-74	IC SN74LS74AN
IC650	8-759-202-27	IC TC74HC157P
IC651	8-759-202-24	IC TC74HC86P
IC701	8-759-906-24	(PAL/SECAM)...IC SN74LS624N
IC801	8-759-904-72	IC MSL9359RS
IC802	8-759-812-90	IC LB1290
IC803	8-759-240-69	IC TC4069UBP
IC901	8-759-700-47	IC CX10035
IC902	8-759-961-38	IC BA6138
IC903	8-759-240-66	IC TC4066BP
IC904	8-759-700-65	IC NJM79L05A
J301	1-507-659-00	JACK (HEADPHONES)
L301	1-408-902-21	MICRO INDUCTOR 0.47UH
L302	1-408-551-00	MICRO INDUCTOR 1UH
L501	1-459-379-00	COIL (WITH CORE)
L502	1-410-015-21	MICRO INDUCTOR 3.3UH
L503	1-410-027-21	MICRO INDUCTOR 33UH
L504	1-410-033-21	MICRO INDUCTOR 100UH
L505	1-410-033-21	MICRO INDUCTOR 100UH
L506	1-410-033-21	MICRO INDUCTOR 100UH
LDF101	1-464-343-11	FILTER UNIT, LOW PASS
LDF102	1-464-299-00	FILTER UNIT, LOW PASS
LDF201	1-464-343-11	FILTER UNIT, LOW PASS
LDF202	1-464-299-00	FILTER UNIT, LOW PASS
LF1	⚠1-421-340-00	LINE FILTER
PS1	⚠1-532-605-00	LINK, IC
Q101	8-769-162-00	TRANSISTOR 2SK152-2
Q102	8-769-162-00	TRANSISTOR 2SK152-2
Q201	8-769-162-00	TRANSISTOR 2SK152-2
Q202	8-769-162-00	TRANSISTOR 2SK152-2
Q301	8-729-141-43	TRANSISTOR 2SD414
Q302	8-729-167-62	TRANSISTOR 2SC2676
Q303	8-729-167-62	TRANSISTOR 2SC2676
Q304	8-769-112-00	TRANSISTOR 2SK120-2
Q305	8-729-180-93	TRANSISTOR 2SD809
Q306	8-729-154-83	TRANSISTOR 2SB548
Q307	8-729-113-82	TRANSISTOR 2SA1138
Q308	8-729-113-82	TRANSISTOR 2SA1138

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CAPACITORS:

- All capacitors are in μF. Common capacitors are omitted. Refer to the following lists for their part numbers. MF:μF, PF:μμF.

COILS

- MMH : mH, UH : μH

SEMICONDUCTORS

In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC, UPD···: μPD···

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

ELECTRICAL PARTS

Ref.No.	Part No.	Description
Q309	8-769-112-00	TRANSISTOR 2SK120-2
Q310	8-729-173-37	TRANSISTOR 2SA733-P
Q311	8-729-606-33	TRANSISTOR 2SC2603-F
Q501	8-729-672-43	TRANSISTOR 2SC2724
Q502	8-729-672-43	TRANSISTOR 2SC2724
Q503	8-729-173-37	TRANSISTOR 2SA733-P
Q504	8-729-606-33	TRANSISTOR 2SC2603-F
Q505	8-729-173-37	TRANSISTOR 2SA733-P
Q506	8-729-606-33	TRANSISTOR 2SC2603-F
Q507	8-729-606-33	TRANSISTOR 2SC2603-F
Q508	8-729-606-33	TRANSISTOR 2SC2603-F
Q509	8-729-606-33	TRANSISTOR 2SC2603-F
Q510	8-729-606-33	TRANSISTOR 2SC2603-F
Q511	8-729-173-37	TRANSISTOR 2SA733-P
Q512	8-729-606-33	TRANSISTOR 2SC2603-F
Q513	8-769-132-00	TRANSISTOR 2SK121-2
Q514	8-729-173-37	TRANSISTOR 2SA733-P
Q515	8-729-173-37	TRANSISTOR 2SA733-P
Q516	8-729-606-33	TRANSISTOR 2SC2603-F
Q517	8-729-606-33	TRANSISTOR 2SC2603-F
Q518	8-769-132-00	TRANSISTOR 2SK121-2
Q519	8-729-606-33	TRANSISTOR 2SC2603-F
Q520	8-729-606-33	TRANSISTOR 2SC2603-F
Q521	8-729-606-33	TRANSISTOR 2SC2603-F
Q522	8-729-606-33	TRANSISTOR 2SC2603-F
Q523	8-729-606-33	TRANSISTOR 2SC2603-F
Q524	8-729-173-37	TRANSISTOR 2SA733-P
Q525	8-729-606-33	TRANSISTOR 2SC2603-F
Q526	8-769-132-00	TRANSISTOR 2SK121-2
Q527	8-729-606-33	TRANSISTOR 2SC2603-F
Q528	8-729-606-33	TRANSISTOR 2SC2603-F
Q529	8-729-672-43	TRANSISTOR 2SC2724
Q530	8-729-900-89	TRANSISTOR DTC144ES
Q531	8-729-900-89	TRANSISTOR DTC144ES
Q532	8-729-900-89	TRANSISTOR DTC144ES
Q533	8-729-606-33	TRANSISTOR 2SC2603-F
Q534	8-729-606-33	TRANSISTOR 2SC2603-F
Q535	8-729-606-33	TRANSISTOR 2SC2603-F
Q536	8-729-606-33	TRANSISTOR 2SC2603-F
Q537	8-729-606-33	TRANSISTOR 2SC2603-F
Q538	8-729-173-37	TRANSISTOR 2SA733-P
Q539	8-729-173-37	TRANSISTOR 2SA733-P
Q540	8-729-606-33	TRANSISTOR 2SC2603-F
Q650	8-729-606-33	TRANSISTOR 2SC2603-F
Q651	8-729-606-33	TRANSISTOR 2SC2603-F

ELECTRICAL PARTS

Ref.No.	Part No.	Description
Q701	8-729-606-33	(PAL/SECAM)...TRANSISTOR 2SC2603-F
Q801	8-729-173-37	TRANSISTOR 2SA733-P
Q802	8-729-173-37	TRANSISTOR 2SA733-P
Q803	8-729-900-61	TRANSISTOR DTA114ES
Q804	8-729-900-89	TRANSISTOR DTC144ES
Q805	8-729-900-89	TRANSISTOR DTC144ES
Q806	8-729-900-61	TRANSISTOR DTA114ES
Q807	8-729-900-61	TRANSISTOR DTA114ES
Q808	8-729-900-61	TRANSISTOR DTA114ES
Q809	8-729-900-61	TRANSISTOR DTA114ES
Q810	8-729-900-89	TRANSISTOR DTC144ES
Q811	8-729-900-89	TRANSISTOR DTC144ES
Q902	8-729-288-02	TRANSISTOR 2SD880
Q903	8-729-173-13	TRANSISTOR 2SB731
Q904	8-729-180-93	TRANSISTOR 2SD809
Q905	8-729-606-33	TRANSISTOR 2SC2603-F
Q906	8-729-606-33	TRANSISTOR 2SC2603-F
Q907	8-729-606-33	TRANSISTOR 2SC2603-F
Q908	8-729-606-33	TRANSISTOR 2SC2603-F
Q909	8-729-900-89	TRANSISTOR DTC144ES
Q910	8-729-606-33	TRANSISTOR 2SC2603-F

Ref.No.	Part No.	Description			
R1	⚠1-202-850-00	SOLID	2.2		1/4W F
R2	⚠1-244-933-00	CARBON	330K	5%	1/2W
R101	1-214-897-00	METAL	22K	1%	1/2W
R102	1-214-880-00	METAL	4.7K	1%	1/2W
R103	1-214-964-00	METAL	1M	1%	1/4W
R104	1-214-832-00	METAL	47	1%	1/2W
R105	1-214-860-00	METAL	680	1%	1/2W
R106	1-214-850-00	METAL	270	1%	1/2W
R107	1-214-884-00	METAL	6.8K	1%	1/2W
R108	1-214-777-00	METAL	100K	1%	1/4W
R109	1-214-888-00	METAL	10K	1%	1/2W
R110	1-214-888-00	METAL	10K	1%	1/2W
R111	1-214-761-00	METAL	22K	1%	1/4W
R112	1-214-753-00	METAL	10K	1%	1/4W
R113	1-214-888-00	METAL	10K	1%	1/2W
R114	1-214-860-00	METAL	680	1%	1/2W
R115	1-214-868-00	METAL	1.5K	1%	1/2W
R116	1-214-897-00	METAL	22K	1%	1/2W
R117	1-214-856-00	METAL	470	1%	1/2W
R118	1-214-864-00	METAL	1K	1%	1/2W
R119	1-214-761-00	METAL	22K	1%	1/4W
R120	1-214-741-00	METAL	3.3K	1%	1/4W
R121	1-214-751-00	METAL	8.2K	1%	1/4W
R122	1-214-911-00	METAL	82K	1%	1/2W

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R131	1-247-847-00	CARBON	4.7K	5%	1/6W
R132	1-247-839-00	CARBON	2.2K	5%	1/6W
R133	1-214-892-00	METAL	15K	1%	1/2W
R134	1-214-762-00	METAL	24K	1%	1/4W
R135	1-214-753-00	METAL	10K	1%	1/4W
R136	1-214-888-00	METAL	10K	1%	1/2W
R138	1-247-879-00	CARBON	100K	5%	1/6W
R140	1-214-879-00	METAL	4.3K	1%	1/2W
R141	1-214-871-00	METAL	2K	1%	1/2W
R142	1-214-888-00	METAL	10K	1%	1/2W
R143	1-214-890-00	METAL	12K	1%	1/2W
R144	1-214-902-00	METAL	36K	1%	1/2W
R145	1-214-878-00	METAL	3.9K	1%	1/2W
R146	1-214-964-00	METAL	1M	1%	1/4W
R147	1-214-777-00	METAL	100K	1%	1/4W
R148	1-214-844-00	METAL	150	1%	1/2W
R149	1-214-765-00	METAL	33K	1%	1/4W
R150	1-247-129-00	CARBON	820	5%	1/4W
R151	1-214-749-00	METAL	6.8K	1%	1/4W
R152	1-214-777-00	METAL	100K	1%	1/4W
R153	1-214-713-00	METAL	220	1%	1/4W
R154	1-214-848-00	METAL	220	1%	1/2W
R155	1-247-839-00	CARBON	2.2K	5%	1/6W
R301	1-214-864-00	METAL	1K	1%	1/2W
R302	1-214-866-00	METAL	1.2K	1%	1/2W
R303	1-214-866-00	METAL	1.2K	1%	1/2W
R304	1-214-864-00	METAL	1K	1%	1/2W
R305	1-214-753-00	METAL	10K	1%	1/4W
R306	1-214-753-00	METAL	10K	1%	1/4W
R309	1-214-903-00	METAL	39K	1%	1/2W
R310	1-214-749-00	METAL	6.8K	1%	1/4W
R311	1-247-847-00	CARBON	4.7K	5%	1/6W
R312	1-247-831-00	CARBON	1K	5%	1/6W
R313	1-247-841-00	CARBON	2.7K	5%	1/6W
R316	1-247-220-00	CARBON	150	5%	1/2W
R318	1-247-879-00	CARBON	100K	5%	1/6W
R319	1-247-853-00	CARBON	8.2K	5%	1/6W
R321	1-247-855-00	CARBON	10K	5%	1/6W
R322	1-247-855-00	CARBON	10K	5%	1/6W
R323	1-247-855-00	CARBON	10K	5%	1/6W
R324	1-247-855-00	CARBON	10K	5%	1/6W
R325	1-247-807-00	CARBON	100	5%	1/6W
R326	1-247-835-00	CARBON	1.5K	5%	1/6W
R327	1-214-902-00	METAL	36K	1%	1/2W
R328	1-214-749-00	METAL	6.8K	1%	1/4W

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R329	⚠1-217-387-00	FUSIBLE	10	5%	1/4W F
R330	⚠1-217-387-00	FUSIBLE	10	5%	1/4W F
R341	1-247-855-00	CARBON	10K	5%	1/6W
R342	1-247-819-00	CARBON	330	5%	1/6W
R343	1-247-818-00	CARBON	300	5%	1/6W
R344	1-247-811-00	CARBON	150	5%	1/6W
R345	1-247-807-00	CARBON	100	5%	1/6W
R346	1-247-821-00	CARBON	390	5%	1/6W
R347	1-247-783-00	CARBON	10	5%	1/6W
R348	1-247-855-00	CARBON	10K	5%	1/6W
R349	1-247-803-00	CARBON	68	5%	1/6W
R501	1-247-104-00	CARBON	75	5%	1/4W
R502	1-247-879-00	CARBON	100K	5%	1/6W
R503	1-247-865-00	CARBON	27K	5%	1/6W
R504	1-247-845-00	CARBON	3.9K	5%	1/6W
R505	1-247-859-00	CARBON	15K	5%	1/6W
R506	1-247-847-00	CARBON	4.7K	5%	1/6W
R507	1-247-825-00	CARBON	560	5%	1/6W
R508	1-247-837-00	CARBON	1.8K	5%	1/6W
R509	1-247-831-00	CARBON	1K	5%	1/6W
R510	1-247-839-00	CARBON	2.2K	5%	1/6W
R511	1-247-831-00	CARBON	1K	5%	1/6W
R512	1-247-893-00	CARBON	390K	5%	1/6W
R513	1-247-847-00	CARBON	4.7K	5%	1/6W
R514	1-247-847-00	CARBON	4.7K	5%	1/6W
R515	1-247-863-00	CARBON	22K	5%	1/6W
R516	1-247-843-00	CARBON	3.3K	5%	1/6W
R517	1-247-847-00	CARBON	4.7K	5%	1/6W
R518	1-247-883-00	CARBON	150K	5%	1/6W
R519	1-247-871-00	CARBON	47K	5%	1/6W
R520	1-247-851-00	CARBON	6.8K	5%	1/6W
R521	1-247-847-00	CARBON	4.7K	5%	1/6W
R522	1-247-823-00	CARBON	470	5%	1/6W
R523	1-247-833-00	CARBON	1.2K	5%	1/6W
R524	1-247-839-00	CARBON	2.2K	5%	1/6W
R525	1-247-855-00	CARBON	10K	5%	1/6W
R526	1-247-883-00	CARBON	150K	5%	1/6W
R527	1-247-871-00	CARBON	47K	5%	1/6W
R528	1-247-855-00	CARBON	10K	5%	1/6W
R529	1-247-831-00	CARBON	1K	5%	1/6W
R530	1-247-823-00	CARBON	470	5%	1/6W
R531	1-247-847-00	CARBON	4.7K	5%	1/6W
R532	1-247-847-00	CARBON	4.7K	5%	1/6W
R533	1-247-863-00	CARBON	22K	5%	1/6W
R534	1-247-839-00	CARBON	2.2K	5%	1/6W

NOTE:
- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " ★ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
- All capacitors are in μF. Common capacitors are omitted. Refer to the following lists for their part numbers.
MF: μF, PF: μμF.

COILS
- MMH : mH, UH : μH

SEMICONDUCTORS
In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC,
UPD···: μPD···

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

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CAPACITORS:
- All capacitors are in μF. Common capacitors are omitted. Refer to the following lists for their part numbers.
MF: μF, PF: μμF.

COILS
- MMH : mH, UH : μH

SEMICONDUCTORS
In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···, UPC···: μPC,
UPD···: μPD···

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R535	1-247-873-00	CARBON	56K	5%	1/6W
R536	1-247-823-00	CARBON	470	5%	1/6W
R537	1-247-855-00	CARBON	10K	5%	1/6W
R538	1-247-867-00	CARBON	33K	5%	1/6W
R539	1-247-887-00	CARBON	220K	5%	1/6W
R540	1-247-871-00	CARBON	47K	5%	1/6W
R541	1-247-875-00	CARBON	68K	5%	1/6W
R542	1-247-851-00	CARBON	6.8K	5%	1/6W
R543	1-247-841-00	CARBON	2.7K	5%	1/6W
R544	1-247-850-00	CARBON	6.2K	5%	1/6W
R545	1-247-847-00	CARBON	4.7K	5%	1/6W
R546	1-247-827-00	CARBON	680	5%	1/6W
R547	1-247-827-00	CARBON	680	5%	1/6W
R548	1-247-847-00	CARBON	4.7K	5%	1/6W
R549	1-247-847-00	CARBON	4.7K	5%	1/6W
R550	1-247-879-00	CARBON	100K	5%	1/6W
R551	1-247-835-00	CARBON	1.5K	5%	1/6W
R552	1-247-863-00	CARBON	22K	5%	1/6W
R553	1-247-823-00	CARBON	470	5%	1/6W
R554	1-247-847-00	CARBON	4.7K	5%	1/6W
R555	1-247-867-00	CARBON	33K	5%	1/6W
R556	1-247-791-00	CARBON	22	5%	1/6W
R557	1-247-871-00	CARBON	47K	5%	1/6W
R558	1-247-855-00	CARBON	10K	5%	1/6W
R559	1-247-871-00	CARBON	47K	5%	1/6W
R560	1-247-852-00	CARBON	7.5K	5%	1/6W
R561	1-247-852-00	CARBON	7.5K	5%	1/6W
R562	1-247-839-00	CARBON	2.2K	5%	1/6W
R563	1-247-873-00	CARBON	56K	5%	1/6W
R564	1-247-865-00	CARBON	27K	5%	1/6W
R566	1-247-871-00	CARBON	47K	5%	1/6W
R567	1-247-863-00	CARBON	22K	5%	1/6W
R568	1-247-839-00	CARBON	2.2K	5%	1/6W
R569	1-247-823-00	CARBON	470	5%	1/6W
R570	1-247-847-00	CARBON	4.7K	5%	1/6W
R571	1-247-823-00	CARBON	470	5%	1/6W
R572	1-247-847-00	CARBON	4.7K	5%	1/6W
R573	1-247-847-00	CARBON	4.7K	5%	1/6W
R574	1-247-847-00	CARBON	4.7K	5%	1/6W
R575	1-247-863-00	CARBON	22K	5%	1/6W
R576	1-247-863-00	CARBON	22K	5%	1/6W
R577	1-247-863-00	CARBON	22K	5%	1/6W
R578	1-247-863-00	CARBON	22K	5%	1/6W
R579	1-247-863-00	CARBON	22K	5%	1/6W
R580	1-247-831-00	CARBON	1K	5%	1/6W

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R581	1-247-863-00	CARBON	22K	5%	1/6W
R582	1-247-855-00	CARBON	10K	5%	1/6W
R583	1-247-855-00	CARBON	10K	5%	1/6W
R584	1-247-855-00	CARBON	10K	5%	1/6W
R585	1-247-855-00	CARBON	10K	5%	1/6W
R586	1-247-855-00	CARBON	10K	5%	1/6W
R587	1-247-855-00	CARBON	10K	5%	1/6W
R588	1-247-855-00	CARBON	10K	5%	1/6W
R589	1-247-855-00	CARBON	10K	5%	1/6W
R590	1-247-813-00	CARBON	180	5%	1/6W
R591	1-247-819-00	CARBON	330	5%	1/6W
R592	1-247-821-00	CARBON	390	5%	1/6W
R593	1-247-827-00	CARBON	680	5%	1/6W
R594	1-247-833-00	CARBON	1.2K	5%	1/6W
R595	1-247-824-00	CARBON	510	5%	1/6W
R596	1-247-831-00	CARBON	1K	5%	1/6W
R597	1-247-807-00	CARBON	100	5%	1/6W
R598	1-247-803-00	CARBON	68	5%	1/6W
R599	1-247-879-00	CARBON	100K	5%	1/6W
R600	1-247-807-00	CARBON	100	5%	1/6W
R601	1-247-803-00	CARBON	68	5%	1/6W
R602	1-247-863-00	CARBON	22K	5%	1/6W
R603	1-247-863-00	CARBON	22K	5%	1/6W
R604	1-247-863-00	CARBON	22K	5%	1/6W
R605	1-247-863-00	CARBON	22K	5%	1/6W
R606	1-247-847-00	CARBON	4.7K	5%	1/6W
R607	1-247-847-00	CARBON	4.7K	5%	1/6W
R608	1-247-847-00	CARBON	4.7K	5%	1/6W
R609	1-247-841-00	CARBON	2.7K	5%	1/6W
R610	1-247-855-00	CARBON	10K	5%	1/6W
R611	1-247-823-00	CARBON	470	5%	1/6W
R612	1-247-847-00	CARBON	4.7K	5%	1/6W
R613	1-247-847-00	CARBON	4.7K	5%	1/6W
R614	1-247-879-00	CARBON	100K	5%	1/6W
R615	1-247-843-00	CARBON	3.3K	5%	1/6W
R616	1-247-815-00	CARBON	220	5%	1/6W
R617	1-247-815-00	CARBON	220	5%	1/6W
R618	1-247-831-00	CARBON	1K	5%	1/6W
R619	1-247-887-00	CARBON	220K	5%	1/6W
R620	1-247-863-00	CARBON	22K	5%	1/6W
R621	1-247-847-00	CARBON	4.7K	5%	1/6W
R622	1-247-879-00	CARBON	100K	5%	1/6W
R623	1-247-851-00	CARBON	6.8K	5%	1/6W
R625	1-247-831-00	CARBON	1K	5%	1/6W
R650	1-246-481-00	CARBON	2.2K	5%	1/4W

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R651	1-246-489-00	CARBON	4.7K	5%	1/4W
R652	1-247-155-00	CARBON	10K	5%	1/4W
R653	1-246-521-00	CARBON	100K	5%	1/4W
R701	1-247-855-00	(PAL/SECAM)...CARBON	10K	5%	1/6W
R702	1-247-856-00	(PAL/SECAM)...CARBON	11K	5%	1/6W
R703	1-247-843-00	(PAL/SECAM)...CARBON	3.3K	5%	1/6W
R704	1-247-847-00	(PAL/SECAM)...CARBON	4.7K	5%	1/6W
R705	1-247-845-00	(PAL/SECAM)...CARBON	3.9K	5%	1/6W
R706	1-247-850-00	(PAL/SECAM)...CARBON	6.2K	5%	1/6W
R801	1-247-831-00	CARBON	1K	5%	1/6W
R802	1-247-863-00	CARBON	22K	5%	1/6W
R803	1-247-863-00	CARBON	22K	5%	1/6W
R804	1-247-863-00	CARBON	22K	5%	1/6W
R805	1-247-831-00	CARBON	1K	5%	1/6W
R806	1-247-855-00	CARBON	10K	5%	1/6W
R807	1-247-855-00	CARBON	10K	5%	1/6W
R808	1-247-863-00	CARBON	22K	5%	1/6W
R809	1-247-891-00	CARBON	330K	5%	1/6W
R810	1-247-875-00	CARBON	68K	5%	1/6W
R811	1-247-875-00	CARBON	68K	5%	1/6W
R812	1-247-875-00	CARBON	68K	5%	1/6W
R813	1-247-875-00	CARBON	68K	5%	1/6W
R814	1-247-855-00	CARBON	10K	5%	1/6W
R815	1-247-875-00	CARBON	68K	5%	1/6W
R816	1-247-875-00	CARBON	68K	5%	1/6W
R817	1-247-875-00	CARBON	68K	5%	1/6W
R818	1-247-875-00	CARBON	68K	5%	1/6W
R901	⚠1-217-387-00	FUSIBLE	10	5%	1/4W F
R902	1-247-839-00	CARBON	2.2K	5%	1/6W
R903	1-247-847-00	CARBON	4.7K	5%	1/6W
R904	1-214-767-00	METAL	39K	1%	1/4W
R905	1-214-737-00	METAL	2.2K	1%	1/4W
R906	1-214-127-00	METAL	620	1%	1/4W
R907	1-214-737-00	METAL	2.2K	1%	1/4W
R908	1-214-755-00	METAL	12K	1%	1/4W
R909	1-247-897-00	CARBON	560K	5%	1/6W
R910	1-247-873-00	CARBON	56K	5%	1/6W
R911	1-247-873-00	CARBON	56K	5%	1/6W
R912	1-247-804-00	CARBON	75	5%	1/6W
R913	1-247-220-00	CARBON	150	5%	1/2W
R914	1-247-885-00	CARBON	180K	5%	1/6W
R915	1-247-863-00	CARBON	22K	5%	1/6W
R916	1-247-847-00	CARBON	4.7K	5%	1/6W
R917	1-247-847-00	CARBON	4.7K	5%	1/6W
R918	1-247-863-00	CARBON	22K	5%	1/6W

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R919	1-247-843-00	CARBON	3.3K	5%	1/6W
R920	1-247-847-00	CARBON	4.7K	5%	1/6W
R921	1-247-791-00	CARBON	22	5%	1/6W
R922	1-247-791-00	CARBON	22	5%	1/6W
R923	1-247-891-00	CARBON	330K	5%	1/6W
R924	1-247-891-00	CARBON	330K	5%	1/6W
R925	1-247-847-00	CARBON	4.7K	5%	1/6W
R926	1-247-847-00	CARBON	4.7K	5%	1/6W
R927	1-247-863-00	CARBON	22K	5%	1/6W
R928	1-247-871-00	CARBON	47K	5%	1/6W
R929	1-247-871-00	CARBON	47K	5%	1/6W
RV101	1-228-809-00	RES, VAR, CARBON 50K/50K (REC LEVEL)			
RV102	1-224-253-XX	RES, ADJ, METAL GLAZE 22K			
RV103	1-224-250-XX	RES, ADJ, METAL GLAZE 2.2K			
RV104	1-224-252-XX	RES, ADJ, METAL GLAZE 10K			
RV105	1-226-980-00	RES, VAR, CARBON 20K/20K (HEADPHONES LEVEL)			
RV201	1-228-809-00	RES, VAR, CARBON 50K/50K (REC LEVEL)			
RV202	1-224-253-XX	RES, ADJ, METAL GLAZE 22K			
RV203	1-224-250-XX	RES, ADJ, METAL GLAZE 2.2K			
RV204	1-224-252-XX	RES, ADJ, METAL GLAZE 10K			
RV205	1-226-980-00	RES, VAR, CARBON 20K/20K (HEADPHONES LEVEL)			
RV501	1-226-235-00	RES, ADJ, CARBON 5K			
RV502	1-228-142-00	RES, VAR, CARBON 20K			
RV901	1-226-235-00	RES, ADJ, CARBON 5K			
RV902	1-226-235-00	RES, ADJ, CARBON 5K			
RV903	1-224-254-XX	RES, ADJ, METAL GLAZE 47K			
RY301	1-515-323-00	RELAY			
RY302	1-515-323-00	RELAY			
RY303	1-515-323-00	RELAY			
S1	⚠1-553-318-00	SWITCH, PUSH (AC POWER)(1 KEY)			
S2	1-554-862-11	SWITCH, PUSH (2 KEY)(14 bit/16bit)			
S3	1-553-739-21	SWITCH, KEY BOARD (REC MUTE)			
S4	1-554-863-11	SWITCH, PUSH (3 KEY)(TRACKING)			
S5	1-554-863-11	SWITCH, PUSH (3 KEY)(AUTO PB MUTE)			
S6	1-554-863-11	SWITCH, PUSH (3 KEY)(COPY)			
S501	1-800-202-XX	THERMISTOR S-10K			
T1	⚠1-447-944-11	(AEP,UK)...TRANSFORMER, POWER			
T1	⚠1-447-945-11	(E).....TRANSTORMER, POWER			
X301	1-567-280-11	VIBRATOR, CRYSTAL			
X302	1-527-948-00	VIBRATOR, CRYSTAL			
X501	1-527-949-00	VIBRATOR, CRYSTAL			
X502	1-527-871-00	OSCILLATOR, LITHIUM TANTALATE			

NOTE:
- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " ★ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
- All capacitors are in μF. Common capacitors are omitted. Refer to the following lists for their part numbers. MF:μF, PF:μμF.

COILS
- MMH : mH, UH : μH

SEMICONDUCTORS
In each case, U : μ, for example:
UA···: μA···, UPA···: μPA···,
UPC···: μPC,
UPD···: μPD···

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The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

9-951-419-11

Sony Corporation

English
84G0694-1
Printed in Japan
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